THE PBL PROJECT

Turning Confusion into Clarity

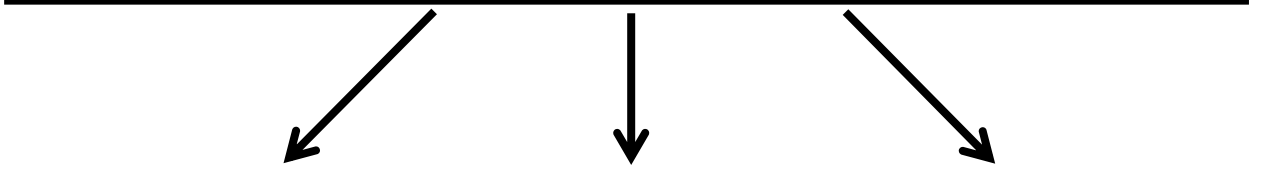
The Scenario:

Print vs. Online Magazines

You are a the owner of a magazine publishing company. Should you publish your magazines online, or continue to print and deliver them to your customers' doors?

The Main Problem:

You are a the owner of a magazine publishing company. Should you publish your magazines online, or continue to print and deliver them to your customers' doors?



The Math Angle

Does the customer prefer reading print magazines or browsing through them online?

The Science Angle

Is reading an online magazine better for the environment than reading a print version?

The Social Studies Angle

How is media changing, and what does it mean for the future?

A Note to the Teacher:

If there was something about the cover or title of this book that interested you enough to pick it up and turn to this page, then you probably already know what we are going to say. The truth is that, in today's world, students must leave the classroom equipped with 21st century skills and ready to meet the challenges of real life. One of the best ways to meet these demands is through interdisciplinary **Problem-Based Learning** scenarios. This type of classroom instruction promotes communication, collaboration, curiosity, organization, and problem-solving skills . . . all major components of any reputable set of standards.

The Problem-Based scenarios in this book integrate Language Arts, Math, Social Studies, Science, and other content areas. They offer educators a chance to shift the work of learning from the teacher to the students, where it belongs. If we wish to prepare a generation of students to solve real-world problems, we simply must give them real-world problems to solve… Problem-Based Learning is the way to accomplish this task.

So, let's get ready to begin! Enjoy,

Your Friendly Editors

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What's in a name?

A Fair Question:

What's the difference between "Problem-Based Learning" and all of these other terms?

- Case-Based Learning
- Challenge-Based Learning
- Design-Based Learning
- Inquiry-Based Learning
- Project-Based Learning
- Team-Based Learning
- Passion-Based Learning
- Work-Based Learning

The Answer:

Nothing… if they are done right.

Each of the terms listed above describes a scenario where students must make choices about a situation based on the information they are given. That's what Problem-Based Learning is all about!

We prefer the term "Problem" because it highlights the thinking element of the process.

By contrast, consider the term "Project-Based Learning." While the process is the same, the word "Project" brings to mind a simple assignment that must be completed in the same way you follow a recipe.

(the word "project" brings to mind a volcano made from baking soda and vinegar)

So, what exactly is "Problem-Based Learning"

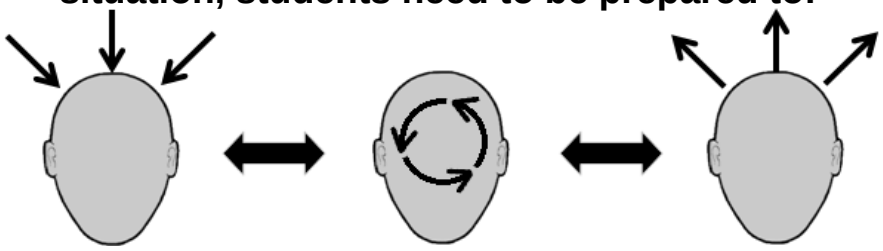
If you're looking for a scholarly academic definition for Problem-Based Learning, this one will do as good as any:

> Problem-Based Learning is an instructional method that challenges students to "learn to learn." It prepares students to think critically and analytically, to work cooperatively with others and with technology, and to find and use appropriate learning resources.

Yes, that's quite a mouthful! The good news is that instead of viewing Problem-Based Learning as a definition, it's better to understand it as a **process**. Here's what we mean:

The 1-2-3 of Problem-Based Learning

When faced with any problem, challenge, or situation, students need to be prepared to:



Step 1	Step 2	Step 3
Absorb the information	**Evaluate the information**	**Generate the response**
Sort through the "stimulus" (articles, videos, discussions, statistics, etc.) that deal with that situation	*Recognize relevant details and organize thoughts based on the "evidence" provided through the surplus of information*	*Generate a logical "response" (design a proposal, form an argument, create a plan-of-action, etc.) based on the evidence*

Now: Wash. Rinse. Repeat.

Students must work through the process multiple times with different scenarios in order to become comfortable with each step.

Why Problem-Based Learning?

The only clear and rational answer to, *"Why Problem-Based Based Learning?"* is to say that "*Students need it.*" Simply memorizing facts, definitions, or mathematical formulas does not equip a student to thrive in today's world. This shift is highlighted by a few recent developments.

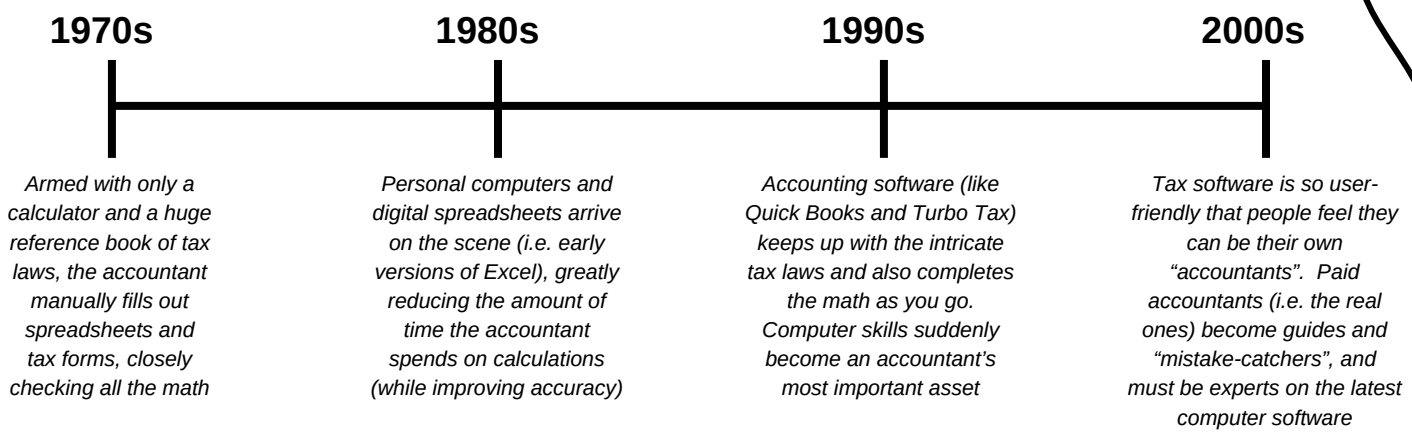
First, new academic standards (including the Common Core) that are being developed around the country are often centered around a simple mantra:

"College and Career Ready"

It seems obvious, but there's a trick. "College and Career Ready" is a moving target. Consider a student who is in upper elementary school right now (ages 8 to 10). There is no telling what career he or she will have twenty years from now, at around 30 years of age. There is a long list of jobs that didn't exist even 10 years ago *(**app designer, social media manager, Zumba teacher**… just to name a few)*. There are certainly many career paths that don't exist now that will be common in a couple of decades *(perhaps a **virtual reality tour guide, body part replacement specialist, or weather modifier***). Likewise, there are jobs that are familiar at the moment that may be on their way out *(watch out **retail cashiers**)*.

To try and predict the specific knowledge base and skill set that students will need for their future careers may be like an old-timer placing his music CDs into a time capsule just so he can have a good laugh twenty years later. To really drive home the point, consider a "predictable" job that has existed for hundreds of years, and will certainly exist for hundreds more. I'm referring to the trustworthy **accountant** (and for this exercise, we'll just look at the "tax preparation" part of the accountant's job, because taxes aren't going anywhere!). Let's see how this job has changed:

The Evolution of an Accountant *(during tax season)*



So, the skill set has changed and the accountant has gone from a quiet, detail-obsessed math guru to a software expert who is willing to empower the customers to do a job that once only he or she could do. And every job is going through similar transitions. One of the main reasons for this development is technology, which brings us to the question raised on the next page.

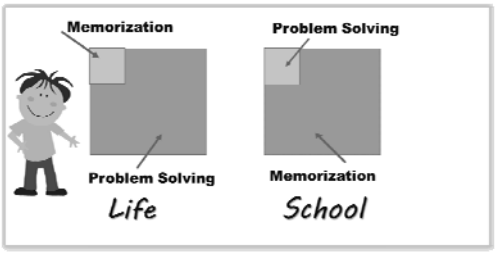
And what about technology?

Here's something to think about: ***What do you teach a student who has access to all of the information in the world?***

It's a fair question. You'd be hard-pressed to find a fact, statistic, quotation, formula, or tiny detail that your average 5th grader can't find in less than a minute with a Smart Phone (or, coming soon, wearable technology). If they are armed with the right technology, students will react like so:

- *"Who wrote Uncle Tom's Cabin?"* - **"No problem."**
- *"What is the formula to find the volume of a rectangular prism?"* - **"Piece of cake."**
- *"What is the diet of the duck-billed platypus?"* - **"Coming right up."**

Consider this visual:



Technology is a game changer. The above illustration shows a trend that has been true for quite some time, and the age of "instant information" only makes life's "Memorization" square smaller.

Yes, there is baseline knowledge every student should have. For example: *Should elementary school students be able to name the first president of the United States?* Of course. *Should middle school students be able to graph a simple formula?* Absolutely.

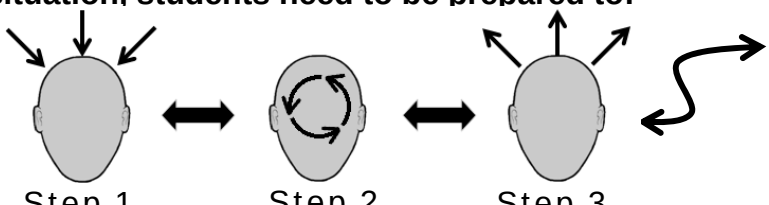
The issue is that the amount of information that is labeled "absolutely must memorize" keeps shrinking and, frankly, gets less critical to a student's success. For example: *Should students instantly know the capital of Alabama?* It's hard to say. After all, it's only a click away.

So, we've established that what students need to know is changing. That leaves one question...

Well, what do they need to know?

We hate to be repetitive (not really), but **it all comes back to the skills of Problem-Based Learning.** These skills will be vital to students regardless of the inevitable changes that the future brings.

When faced with any problem, challenge, or situation, students need to be prepared to:



Step 1
Absorb the information

Step 2
Evaluate the information

Step 3
Generate the response

The age of "instant information" may create a shift in classroom instruction, but it should be embraced by teachers and students. What is important to remember is that absorbing the information is just a small part of the process (as shown). In fact, technology can also be used to approach the other steps in unique ways (especially the way the student can respond in 'Step 3')

What are the key features?

When carried out correctly, a classroom that revolves around Problem-Based Learning has a flow and level of engagement that is hard to match with any lesson that begins with *"turn to page 17 in your textbook."* Listed below are characteristics that you'll notice in a class that is working on a Problem-Based Scenario like the one offered in this book:

The PBL Checklist

- ☑ Students focus on content that is relevant to them in **real-world scenarios**
- ☑ The **teacher serves as the mediator,** and **students are in charge** of managing, planning, and executing the task
- ☑ Students demonstrate **21st Century Skills** (collaborating, researching, communicating, etc.)
- ☑ Instead of a single answer, students consider **multiple points-of-view**, and search for **evidence to support their views**
- ☑ Knowledge, skills, and information **integrates across multiple subjects**
- ☑ **Students respond in a variety of ways**, creating "products" that go beyond writing an answer to a single question

What are misconceptions?

The term "Problem-Based Learning" (along with any of the related ones on page 6) is often used out of context or with no clear idea in mind. As a result, both critics and supporters of the strategy commonly identify PBL with characteristics that simply aren't true. Here are some common misconceptions we've run across:

Misconceptions of Problem-Based Learning

The misconception: **"There is no wrong answer."**

The truth: ***A Problem-Based Scenario will not have a single, "correct" answer. However, a response that is not logical and where no effort has been made to support it is a "wrong" answer.***

The misconception: **"Problem-Based Learning is just the hot topic that is currently gaining momentum (i.e. it's a fad)."**

The truth: ***Problem-Based Learning has been around for generations, and will be around for many more. It is becoming more essential in a world where facts are instant and effortless, making "thinking" a powerful skill.***

The misconception: **"Problem-Based Learning isn't about 'facts'."**

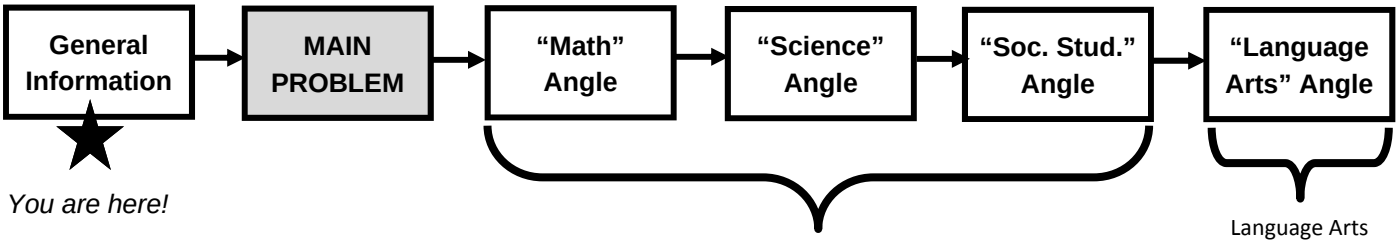
The truth: ***You always have to have the facts right. However, in today's world, finding facts on any topic is usually just a click away. It's what you do with those facts that matters—that's Problem-Based Learning.***

The misconception: **"The learning really begins when students are given a problem they've never considered before."**

The truth: ***There are few things in life that aren't a "problem" (What should I buy at the store? Where should we go on vacation? What can we do this weekend?). The skills of Problem-Based Learning can be developed with all of these.***

How does this book work?

This book is divided into several sections, listed below in the order in which they will appear:



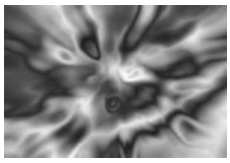
You are here!

We will look at the Main Problem from several points-of-view, each conveniently divided into a core subject area.

Language Arts serves as the "hub," where students will use all points-of-view to provide a comprehensive response to the Main Problem.

This "subject angle" format works well because the goal is to simulate a real-world scenario within a school setting. As the illustration below suggests, they do not always replicate one another:

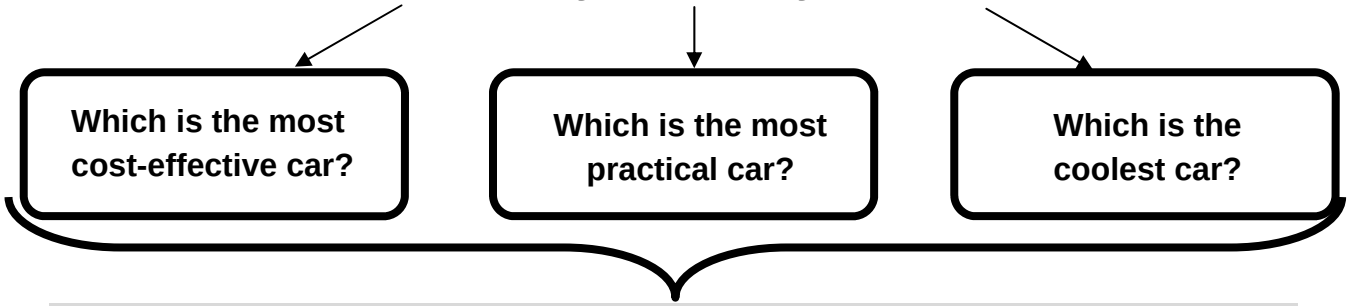
School =

Life = 

Think of it like this…

This is your MAIN PROBLEM SCENARIO

You need to buy a new car. Which car is the best fit for you and your situation?



These are the different perspectives from which it's necessary to approach the Main Problem. In our scenario, these perspectives will all fit nicely into a core subject area and are referred to as the "subject angles."

So, which car are you going to buy?

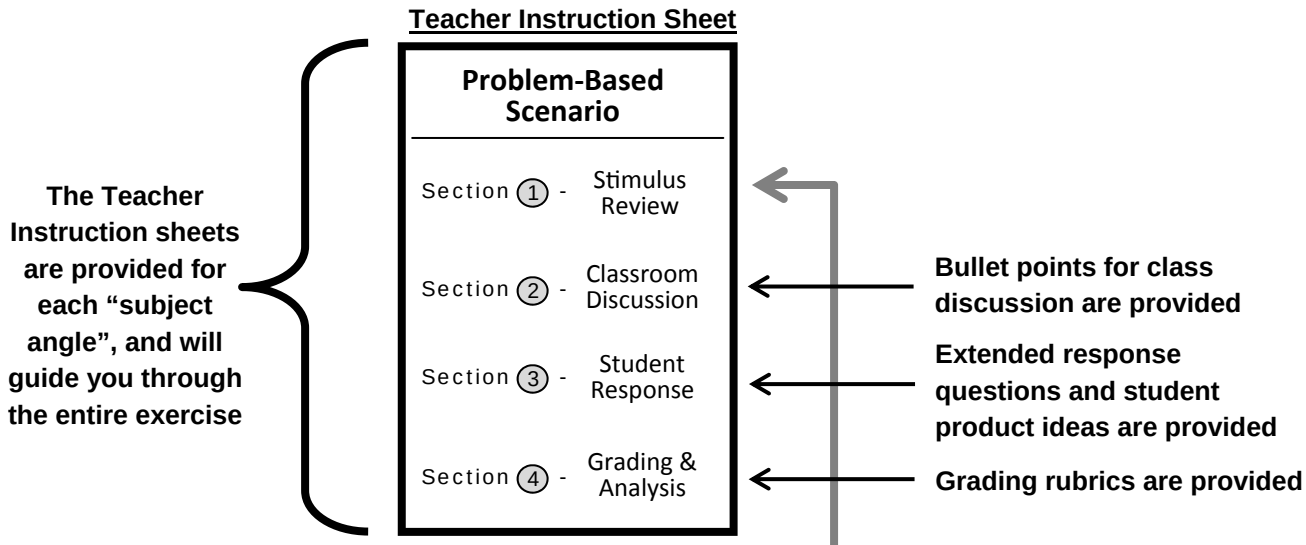
In the end, the different perspectives must be evaluated to provide a single response to the Main Problem. In our exercise, this comprehensive answer is provided in the Language Arts section.

What is provided?

The short answer is "everything you need!"

As you work through the Problem-Based Scenario in this book, both you and your students will be provided with the necessary resources each step of the way.

Teacher Resources



Student Resources

- **Stimulus Items *(articles, videos, infographics, statistics, etc.)* are all provided for each exercise**
- **"Thought-Gathering" sheets are provided to help students organize their ideas**
- **Handouts to introduce and provide instructions for all steps of each exercise**

Remember, a unique set of all of these resources will be provided for each "subject angle"

Standard Alignment

How many times have you reviewed a new resource and asked, "*How does this align to* **my** *standards?"* It's certainly a fair question, especially considering how teachers themselves are assessed and how their performance is monitored.

What's interesting is how teachers like to refer to them as "my standards." Often times, an obsession over a specific set of standards—whether it is a set of state standards or even the Common Core—can result in extremely qualified educators missing a few simple steps. The most important of those steps may be to define what exactly is meant by the term "standards."

For our purposes, we'll simply say that "standards" are a written description of what a student should know and what he or she should be able to do related to a specific subject area. A clear set of standards will even tell how well a student should know it and well they should be able to do it.

From that broad perspective, standards really don't differ too much around the country. You can argue the subtleties all day, and yes some standards are certainly clearer and more logical than others. Still, everyone agrees that by the time a student finishes 1st grade, he or she should know the differences between the seasons… and a 4th grader should not only know the name of our first president, but also understand why our founders were so adamant about checks and balances… and a student should finish elementary school with a firm grasp of all four mathematical operations.

You get the point. Of course, a great set of standards will make these milestones very clear and help a teacher accomplish the goals without missing any steps along the way. We certainly hope that the problem scenario in this book will be helpful.

As you go through this book, each "subject angle" will provide specific learning goals based on the topics that fit the exercise. In most cases, students will achieve the goals simply by working through the exercise. In other cases, they will have to be "led there" with a little help from the teacher.

However, it's important to note that Problem-Based Learning isn't about absorbing names, dates, facts, and figures. A textbook is still great for that. The next page will outline several "hidden learning goals" that are extremely important, and that a textbook just won't touch.

The concept of Higher-Level Thinking is certainly nothing new, and a number of "educational scholars" have worked hard to define and classify the concept. We're not going to try to invent the wheel here. Instead, we're going to use the work of the experts to show how vital Problem-Based Learning is to a student's education:

Webb's Depth of Knowledge

(the very abbreviated version)

DOK 1	- recalling information, citing evidence, following simple instructions	**Demonstrated as students review various stimulus items**
DOK 2	- understanding and explaining concepts, which can lead to sound predictions and interpretations	**Demonstrated during class discussion and the "thought-gathering" phase**
DOK 3	- using information and concepts to make broad connections and interpret and support abstract ideas	**Demonstrated as students answer the Extended Response questions**
DOK 4	- applying ideas and concepts in a different situation, creating something new with information	**Demonstrated as students create their "Products" for each exercise**

21st Century Skills

- **Critical Thinking**
- **Researching**
- **Creativity**
- **Planning**
- **Communication**
- **Collaboration**
- **Leadership**
- **Technological Ability**
- **Social Awareness**
- **Scientific Literacy**
- **Entrepreneurialism**
- **Flexibility / Adaptability**
- **Internet / Media Literacy**
- **Data Analysis**
- **Personal Expression**

Life Habits

- **Patience**
- **Perseverance**
- **Imagination**
- **Leadership**
- **Healthy Skepticism**
- **Self-Direction**

Throughout a student's education, he or she must develop skills and lifelong habits in order to succeed.

It is in the development of these abilities and traits that traditional teaching methods often fall short, and where Problem-Based Learning greatly succeeds.

*"Ask not whether **Problem-Based Learning** fits into the new standards… ask whether the new standards fit into **Problem-Based Learning.**"*

When considering standard-alignment, it is the development of skills and habits that is the greatest benefit of PBL!

The Main Problem:

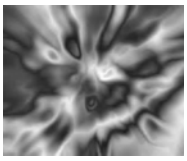
Here is the Problem-Based Learning scenario that is the focus of this guide:

> You are the owner of a magazine publishing company that is under pressure to thrive as the industry quickly changes. You must decide between publishing your magazines online, or continuing to print and deliver them each week to your customers' doors. What are the issues involved, and what is best for the company?

Of course, every significant challenge in life needs to be looked at from several points-of-view. For the Problem-Based Scenario in this book, the different "points-of-view" have been divided into a math angle, a science angle, and a social studies angle. Then, in Language Arts, all points-of-view are evaluated into a single approach.

Obviously, life isn't so cleanly divided into subject areas. Remember the visual that you saw on page 12:

School



Life

It's certainly a challenge—impossible, actually— to have "real life" crunched into a box that fits the academic schedule. Still, having students review a problem from several angles (even if they are neatly divided along subject lines) helps them understand that problems are multi-dimensional, made up of pieces so complex that they must be evaluated on their own. Only after all of the pieces have been individually examined can the problem be properly approached as a whole.

So, each "subject angle" is one piece of the puzzle. That's not to say they aren't plenty challenging in their own right. In fact, they are wonderful exercises for math, or science, or social studies class, even if you never have a chance to get into the other subject points-of-view.

Now we're ready to begin. The page to the right outlines the "subject angles" that we've created for the Problem-Based Scenario shown above.

The "Subject Angles":

In order to properly respond to the Main Problem, it is important to consider multiple points-of-view. Below are several angles from which to approach the problem.

The Math Angle:

Does the customer prefer reading print magazines or browsing through them online?

Students will analyze survey data to determine how people prefer to read magazines—in print (i.e. paper) format or on the computer screen.

The Science Angle:

Is reading an online magazine better for the environment than reading a print version?

Students will review various perspectives and determine if there is any environmental gain or loss associated with the switch from paper magazines to the internet. They will also decide how much this should influence the actions of publishing companies.

The Social Studies Angle:

How is media changing, and what does it mean for the future?

Students will review the rise and importance of mass media, and understand how media has changed over the years (and in what ways it will continue to change). They must decide how these trends should influence the actions of publishing companies.

★ **Language Arts** serves as the hub for the entire exercise. It is in ELA that all of the other "subject angles" are evaluated and measured against one another, and a final decision about how to approach the Main Problem Scenario is made based on all of the available information.

A Note to Parents

Of course parents like to be kept in the loop, so they will appreciate a note home to tell them about the Problem-Based Learning and the specific scenario you will be working on with your students. But there's another reason (perhaps a bit more sneaky) why we like to send the letter home. It helps set a tone for the entire exercise, prompting students to approach it with respect and a level of seriousness. It is safe to say that when you send the "letter home", you mean business.

We've written a sample letter below that can be a model for your Parent Letter. Obviously, you can add your own spin on it as you wish:

Dear Parents,

Our class is preparing to engage in a Problem-Based Learning exercise. The term "Problem-Based Learning" (or PBL) is being used more frequently in education, and I just want to take a moment to explain what we will be doing and what the goals are.

First, it's an important part of an educator's job to make sure students leave the classroom equipped with 21st century skills (i.e. skills that focus on communication, organization, technology, and problem-solving). We use these skills every day. Unfortunately, they are often overlooked as students work to absorb names and dates and facts and figures.

For example, let's say you have to go to the bank in the afternoon. In school, we may have a lesson on map reading and ask the students to find the best way to get to the bank. Of course, that's an incomplete look at the challenge of actually going to the bank. In real life, getting directions to the bank is the easy part. To make it a successful outing, you will also ask yourself:

- *What time do I need to go? What are the banking hours? What will traffic be like?*
- *Why am I going? What do I need to bring? Is this a drive-through visit or do I need to go inside?*
- *What else do I need to do this afternoon? How will my bank visit work into my overall schedule?*

And so on… The ability to answer (and know enough to ask) these questions and respond accordingly enables you to use your time and resources in the best way (even with something as simple as going to the bank) . Students need to learn to do the same. Allowing students to work through Problem-Based Learning scenarios will help them develop the skills that go beyond simple memorization.

For our problem-base scenario, we are going to fast-forward to the day when the students are working citizens, and they will have to address a real problem that has no easy answer. Here's the specific task:

You are the owner of a magazine publishing company that is trying to thrive as the industry changes. You must decide between publishing your magazines online, or continuing to print and deliver them each week to your customers' doors. What are the issues involved, and what is best for the company?

Obviously, this is not a "yes or no" problem. To come up with a logical approach, students will review different "stimulus items" related to the topic (articles, videos, statistics, infographics, etc.), engage in classroom discussion, and organize their thoughts as they absorb information. They will look at the problem scenario from several points-of-view across multiple subject areas. Next, they will work in groups to come up with the best approach to problem, and they will present their findings in a simulated "real-life" situation. It will be challenging, but very enjoyable and it will ultimately bring a tremendous sense of accomplishment. Best of all, this exercise will help develop a wide variety of skills that students will use the rest of their lives!

Your Friendly Teacher

The Intro to Students

This is the fun part! The success of this exercise greatly depends on the excitement and engagement of the students. As you know, it's best if you can hook them right from the start. We took this into consideration when creating this Problem-Based Scenario, and these are points that might be worthwhile to stress when introducing the Main Problem:

1. **First Person** — *your students are main players in the problem… they are not solving an abstract problem for someone else*
2. **Real-World** — *the problem scenario is a real-life situation… this makes it more relevant and increases engagement*
3. **Sense of Urgency** — *simple phrases like "you must" and "it is important to" help add a sense of urgency*
4. **Short and Sweet** — *limit the introduction of the problem scenario to a few sentences… the details will be ironed out later*

The Main Problem

1 *The students are participants in the problem, so they will be approaching it from a **first person** perspective*

You are the owner of a magazine publishing company that is under pressure to thrive as the industry quickly changes. You must decide between publishing your magazines online, or continuing to print and deliver them each week to your customers' doors. What are the issues involved, and what is best for the company?

2 *This scenario is a very **real-world** problem that is being dealt with in today's work force. Students most likely have a previous awareness of the issue, or they should become aware of it. Either way, it makes the exercise more engaging.*

3 *By definition, a problem should have a **sense of urgency** (otherwise, it's not a problem at all). The wording of the Main Problem was chosen to stress that it is something that must be addressed. Students will become more engaged if they, too, feel the pressure of the situation.*

4 *As students work through the problem, they will be exposed to many details and related resources. For the introduction, though, it's best to keep it **"short and sweet"** as shown above. This not only grabs students' attention, but it actually makes it easier to understand the final goal of the problem scenario.*

Section 2:

"The Math Angle"

Teacher Instruction Sheet

The Main Problem Scenario:

You are a the owner of a magazine publishing company. Should you publish your magazines online, or continue to print and deliver them to your customers' doors?

The "Math Angle":

Does the customer prefer reading print magazines or browsing through them online?

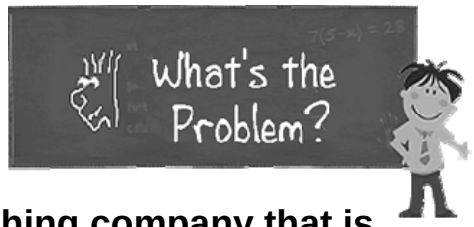
The MATH ANGLE

*Your **Teacher Instruction** page is shown to the right. A unique Teacher Instructions sheet is created for each "subject angle" of the Main Problem Scenario, and walks through the entire process of viewing the problem from that point-of-view. Everything that is referenced in the Teacher Instructions (student stimulus items, classroom discussion sheets, thought-gathering sheets, rubrics) will be provided as you work through the exercise.*

Make a photocopy of the Teacher Instructions to walk you through the entire "math angle"

Teacher Instructions:

"Print vs. Online Magazines"



Problem Scenario: **You are the owner of a magazine publishing company that is under pressure to thrive as the industry quickly changes. You must decide between publishing your magazines online, or continuing to print and deliver them each week to your customers' doors. What are the issues involved, and what is best for the company?**

Your students will be viewing this problem from an **MATH** perspective.

Does the customer prefer reading print magazines or browsing through them online?

Students will analyze survey data to determine how people prefer to read magazines—in print (i.e. paper) format or on the computer screen.

Step 1
Review Stimulus Items

Stimulus Item #1 — "How do you read?" (survey results)

Stimulus Item #2 — "A Look at the Options" (article w/ statistics)

Stimulus Item #3 — "Print vs. Digital" (infographic)

***Students should take notes as they review the Stimulus Items*

Step 2
Classroom Discussion

Lead a **class discussion** about issues related to the topic.
You are being provided a sheet to help you guide the classroom discussion.

Step 3
Student Response

***students should have access to their notes as they enter their answers*

****students may also have access to the Stimulus Items as they enter their answers*

Extended Response: Have students answer the following questions. Remind students to use information from the Stimulus Items to support their response.

1) **How can a customer survey be used to help a magazine publisher decide whether to distribute a magazine in print or online? How might a survey be misleading?**
2) **Based on survey results (provided in Stimulus #1), which do students prefer—print magazines or online magazines? Why is this most likely the case, and is it likely to change?**

Product Option: Divide your students into groups, with each group becoming the **Research Team** for a large magazine publisher. The team has been given the task of creating a survey to determine whether the magazine should switch to an online format, or continue printing and delivering magazines to your customers' doors. The teams must make a list of questions that will result in the correct data that will be needed to make the decision. As a class, discuss why certain questions were chosen, and create a "Master List" of the best questions. Have the class (and perhaps other classes) take this survey and **analyze the results**. What do they suggest the correct course of action should be for the company? Is there any way that the survey results might be deceiving as to the best strategy for the company.

Step 4
Analysis

Rubrics to grade student entries have been provided, and all questions have been mapped to the content standards.

Math Standards

As students work through this section of our Problem-Based Scenario, they'll be focusing on several mathematical content areas. This includes:

Student Handout

- **Survey Analysis**
- **Numbers and Operations**

In addition—and perhaps more importantly—students will need to take on a mathematical frame of mind (in academic circles, this is referred to as the "Standards for Mathematical Practice"), which is a key benefit of Problem-Based Learning. This means that students will need to:

- **Make sense of problems and persevere in solving them.**
- **Reason abstractly and quantitatively.**
- **Construct viable arguments and critique the reasoning of others.**

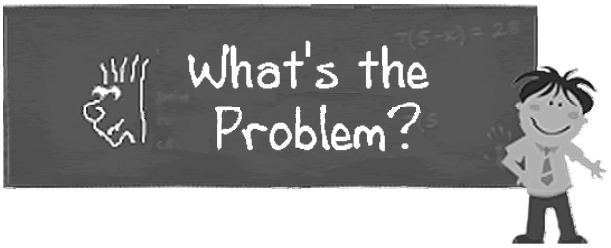
The MATH ANGLE

You may want to share the goals listed above with your students prior to beginning the exercise, but the best part is that they'll be developing these skills whether they realize it or not!

The most important thing to remember when introducing the Problem-Based Scenario is to grab student interest right away. It is a fun and challenging exercise, and you certainly want students to approach it that way.

To make this easy for you, we have created a handout to introduce the "math angle" to your students for this Problem-Based Scenario. This will help them see that they will be looking at the Main Problem Scenario from a specific point-of-view, in this case with a mathematical focus.

Make photocopies of the next page to introduce the "Math Angle" of this Problem-Scenario to your students



Are you ready to tackle the problem?

The Scenario:

You are the owner of a magazine publishing company that is under pressure to thrive as the industry quickly changes. You must decide between publishing your magazines online, or continuing to print and deliver them each week to your customers' doors. What are the issues involved, and what is best for the company?

In order to properly respond to a complicated problem like the one above, you must view it from different points-of-view. In this case, we will consider the following:

Something to think about:

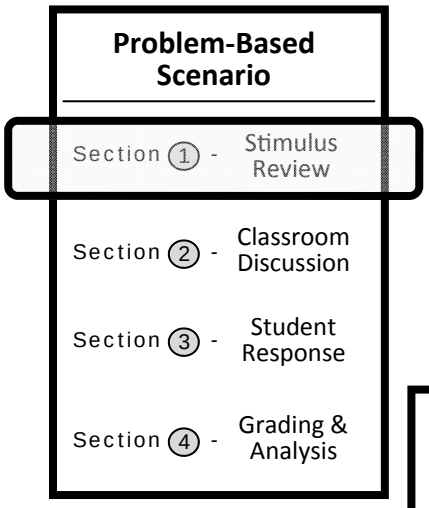
Does the customer prefer reading print magazines or browsing through them online?

Prior to giving your response, you will review multiple resources, engage in classroom discussion, and take time to organize your thoughts.

In this exercise, you will analyze survey data to determine how people prefer to read magazines—in print (i.e. paper) format or on the computer screen.

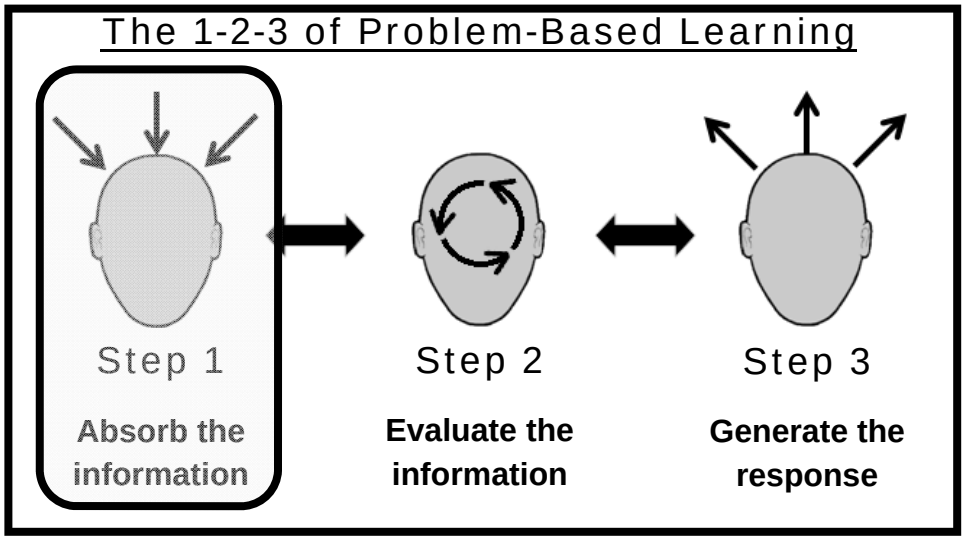
★ *As you work on this exercise, remember that this is primarily a **mathematics question**. This means that numbers, statistics, and calculations will be needed to support your ideas!*

Teacher Instruction Sheet



Stimulus Review

The Stimulus Review is Section 1 *on your* ***Teacher Instruction Sheet.***



The MATH ANGLE

It's a fancy term, but the "Stimulus Review" is simply the first step in Problem-Based Learning where students review a variety of information surrounding the specific problem or challenge.

In our Problem Scenario, all of the Stimulus Items have been provided for you. We have intentionally gathered a variety of different types and sources. This is important in today's modern world where information comes from all directions, and also sets the stage for Step 2 (Evaluating the Information).

A few examples of the types of Stimulus Items you might see in a Problem-Based Scenario include:

- **Articles**
- **Videos**
- **Infographics**
- **Blogs**
- **Statistics**
- **Lists**
- **Websites**
- **Editorials**
- **Audio Recordings**
- **Cartoons**
- **Primary Sources**
- **Advertisements**

...and much more!

For your convenience, we've placed all of the Stimulus Items for this Problem-Based Scenario on a special website where **both you and your students** can have full access to them. To access these resources, you will go to:

http://www.pblproject.com/students

Login:
Password:

The Stimulus Items you'll see for this section of the exercise include:

Stimulus Item #1

— "How do you read?" (survey results)

Stimulus Item #2

— "A Look at the Options" (article w/ statistics)

Stimulus Item #3

— "Print vs. Digital" (infographic)

A Few Notes:

There are a couple of things we'd like to highlight as your students get ready to dive into the Stimulus Items. First, these are actual sources that have been gathered for the topic at hand, even if they have been edited or adapted at times due to length, format, or readability. That means that they don't necessarily reflect our personal opinions, and we certainly don't want to take credit for the hard work of others (all source information will be provided). It does, however, provide a nice mix for your students.

Next, the Stimulus Items should give your students the background information they need to generate their responses to the Problem-Based Scenario. There is no need for you to seek out other resources or for students to do their own research.

With that said, it is always great if there is an opportunity for students to get on a computer or head to the library to find their own background information. Being able to conduct your own research is a vital skill to have, and it is referenced throughout Language Arts standards.

Again, this extra step is not necessary to successfully go through the exercise (we know you're already crunched for time!), but we figured it was worth mentioning!

Teacher Instruction Sheet

Problem-Based Scenario

Section 1 - Stimulus Review

Section 2 - Classroom Discussion

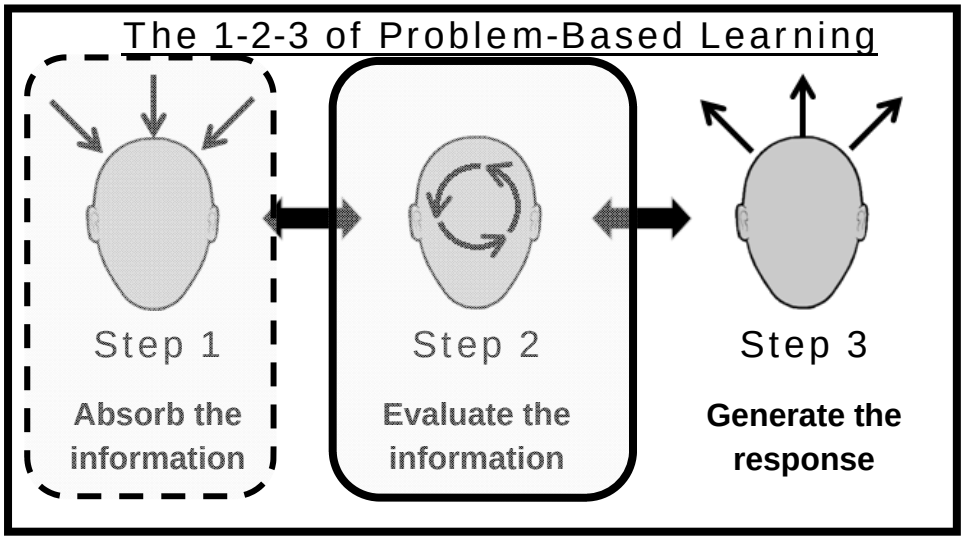
Section 3 - Student Response

Section 4 - Grading & Analysis

Classroom Discussion

The Classroom Discussion is Section 2 *on your* ***Teacher Instruction Sheet.***

Teacher "Quick Sheet"

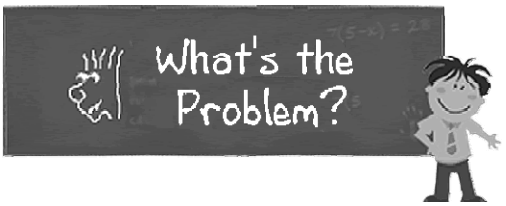


The MATH ANGLE

Now that your students have reviewed the Stimulus Items, it is a fitting time to have a **class discussion** about the Problem-Based Scenario (specifically, the "subject angle" that you're working with).

At this stage, there will be a limited amount of new information brought to the table (Step 1), although you might want to introduce ideas not covered in the Stimulus, and perhaps students will share original thoughts and experiences. For the most part, though, the classroom discussion is where you want students to evaluate the information (Step 2) to which they've been exposed. It is now that they will begin to organize it all and decide how it will fit together in their response.

The key to a classroom discussion, of course, is keeping everything focused and moving it in the direction you want, and at the same time creating a free environment for students to share and build on ideas. This is certainly where teachers earn their pay! One way we've tried to help (a little bit, at least) is to provide you with the talking points that work well for this scenario. The bold questions are what you will ask your students, and each has bullet points that you can use to guide the discussion.



Leading Questions for Classroom Discussion

Print vs. Online Magazine (math angle)

How can surveys be used to determine which is a better way to deliver news to people—print or online magazines?

- Consider who would be best to take the survey (*i.e. should it be random, or just people who read newspapers, or people who would be willing to pay for a news service of some kind)*
- Consider the appropriate questions for the survey *("How do you get your news?" or "Would you be willing to pay for a newspaper subscription" or "Do you carry a Smart Phone?", etc.)*
- Consider how the survey results will be analyzed and can ultimately be used to guide the decisions of a newspaper company

What are the most likely factors that determined the outcome of the survey?

- Consider how the sample of people who take the survey will be a major factor in the results of the survey
- Consider how the wording of questions can change the results of the survey (such as *"Do you read news articles on the internet?"* versus *"Do you think the internet is best for getting your news?"*)
- Consider how the survey might yield different results depending on when it is given, such as five years ago (before most people had Smart Phones) versus today

How can a news publishing company use the information from the survey?

- Consider why it is important to know the "sample" for your data (i.e. the people taking the survey), and how that knowledge will factor into decision making
- Consider how a news company might decide to change their business model—or keep it the same—based on the results of the survey
- Consider how a news company might decide to make adjustments so that the next time the survey is given the users give different answers (such as making it more desirable to read a newspaper)

Teacher Instruction Sheet

Problem-Based Scenario

Section ① - Stimulus Review

Section ② - Classroom Discussion

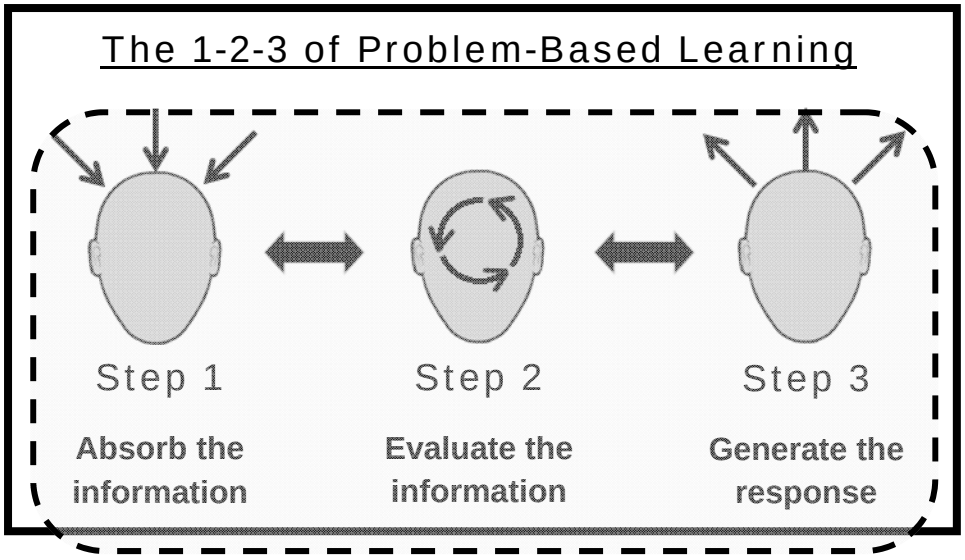
Section ③ - Student Response

Section ④ - Grading & Analysis

"Thought-Gathering" Sheet

The "Thought-Gathering" Sheet is an interim step prior to the student responses.

Student Handout



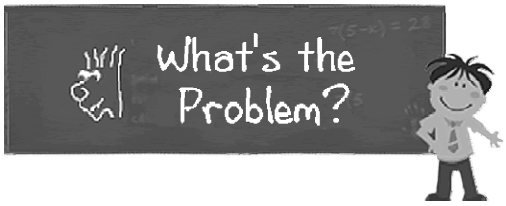
The MATH ANGLE

So, by this point, you've had students review Stimulus Items related to the Problem Scenario. That led to a stimulating (we hope) classroom discussion on the topic.

Often times, there is a feeling of "information overload" at this stage. Students have enough information to generate their constructed responses and/or fulfill their product options (we'll talk about these on the upcoming pages), but their thoughts may be all over the place. They may still have to pick their position, refine their arguments, focus their proposal, perfect their design… and so on.

That's where the **"Thought-Gathering" Sheet** comes in. This isn't to be confused with any "note-taking sheets" your students may have written while they were looking through the Stimulus Items or listening to the discussion. Rather, this is a final stage where they sort everything (including their own notes) to prepare for their response. It is a chance to tie together Step 1, Step 2, and Step 3 (shown above).

We have provided a "Thought-Gathering" sheet that works with this exercise and is a good chance for students to organize their ideas prior to creating their responses.



My news company should deliver the news via:

Newspapers	The Internet
Reasons why newspapers are better:	**Reasons why the Internet is better:**

Based on the points listed above, I feel that a news company should do the following:

_____

_____

_____

Teacher Instruction Sheet

Problem-Based Scenario

Section 1 - Stimulus Review

Section 2 - Classroom Discussion

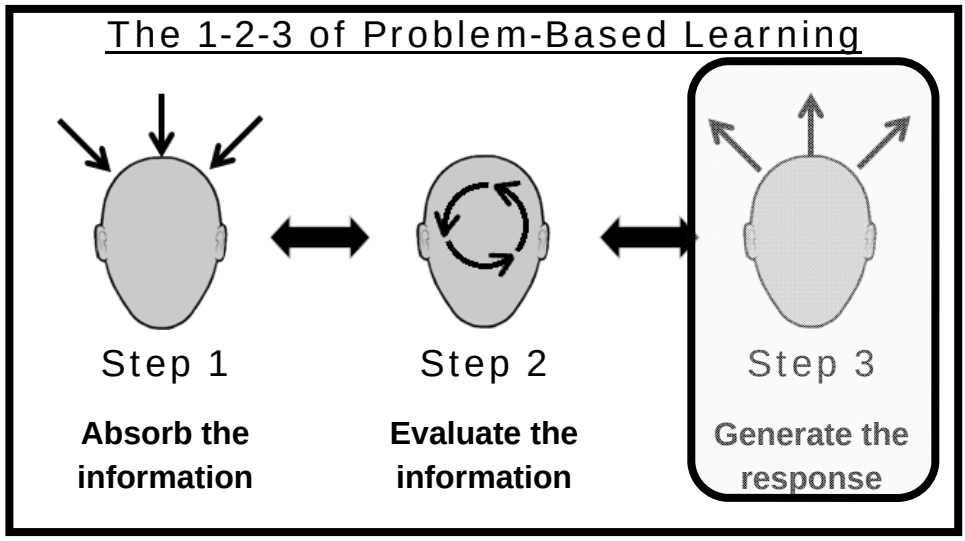
Section 3 - Student Response

Section 4 - Grading & Analysis

Student Responses
(Extended Response)

The Student Responses are Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout



The MATH ANGLE

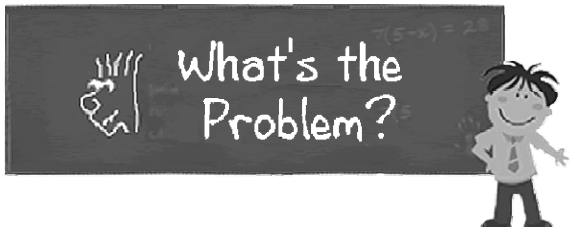
On your Teacher Instruction sheet, you'll see that each scenario provides two types of response options for your students—Extended Responses and the Product Option. Let's look at the **"Extended Responses"** first.

As you would expect, the Extended Responses are simply questions centering around the Problem-Based Scenario that the students answer through their writing.

Most likely, the Extended Responses are similar to what you might see during a Performance Task of a comprehensive assessment (where students are given a range of information to review, and then must give their conclusions based on the evidence). The "test prep" benefits alone make it worthwhile for students to complete the Extended Responses, but the broader benefit is their ability to take the information they've been exposed to and generate a logical response to a problem scenario.

The rubric and process for grading Extended Responses is on the following pages. Also, we will leave it up to you whether you want to allow students to use notes they have taken throughout (we think it's fine for them to do so), and also how strict you want to be with time limits (a half hour or so should be fine).

Here are the Extended Response questions for this scenario.



What do you think?

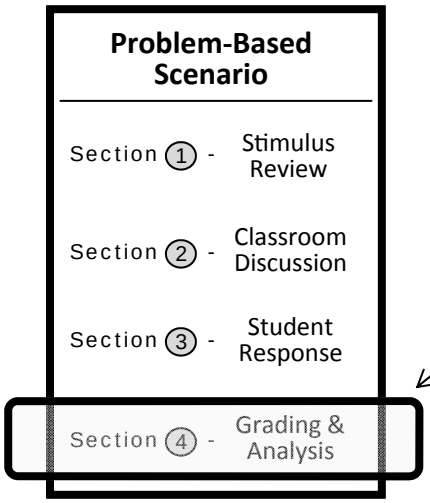
The questions below are centered around the Problem-Based Scenario you've been reviewing. Please answer the questions on separate sheets of paper.

1) **How can a customer survey be used to help a magazine publisher decide whether to distribute a magazine in print or online? How might a survey be misleading?**

2) **Based on survey results (provided in Stimulus #1), which do students prefer—print magazines or online magazines? Why is this most likely the case, and is it likely to change?**

★ *Remember to support your answers with evidence that you've gathered from what you've read and discussed in class!*

Teacher Instruction Sheet



Grading Rubric
(Extended Responses)

The Grading Rubric is Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

The MATH ANGLE

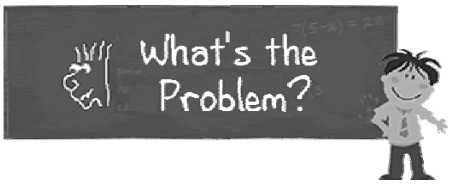
One thing that your students must understand about these Problem-Based Scenarios is that the answer is never "yes" or "no". Instead, students must think their way through the muddy waters of different situations and challenges, while you guide them along the journey.

Of course, the end result needs to be more than a pat on the back—and that's why proper grading is so important. While students may feel that grades exist only to cause stress and fill the blank spaces on a report card, the broader reason is that when students are graded in a clear and fair way, it enables them to continually improve their approach and response.

The Extended Responses for this scenario can be graded using the rubric to the right. It is divided into four sections:

1) Math Content (*What do you want students to bring to the table based on previous lessons?)*
2) Writing Focus *(Was it clear what point the students were trying to make?)*
3) Use of Evidence *(Did the students back up their position with evidence, quotes, statistics, and facts?)*
4) Language & Conventions (*Did students limit mistakes and respond in a thorough and professional manner?)*

Here is a copy of the rubric for your students to review.



How do I get an A?

Listed below are the four different areas that will be evaluated as your responses are graded. Be sure to consider each area as you write.

Rubric Section #1: Math Content – you must show a high level of background knowledge and general understanding of the topic

**in other words: *What are you bringing to the table based on previous lessons?*

4	3	2	1	NS
You proved throughout your response to have a high level of background knowledge of the subject.	**You showed a reasonable level of background knowledge through most of your response.**	**You showed a limited level of background knowledge, and only in certain parts of your response.**	**You showed barely any background knowledge of the subject throughout your response.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #2: Production & Distribution of Writing – you must organize and sustain your writing based on a defined purpose

**in other words: *Was it clear what point you were trying to make, and did you focus on that point?*

4	3	2	1	NS
Your response had a defined purpose, and it was organized with a clear focus on that purpose.	**Your response had a defined purpose, although it lacked organization and a clear focus on that purpose.**	**The purpose of your response was a bit vague, and there was limited organization and focus.**	**There was no defined purpose or organization to your response.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #3: Integration of Knowledge and Ideas (use of "evidence") – you must support your arguments and positions with outside information (i.e. "stimulus items")

**in other words: *Did you back up your position with evidence, quotes, statistics, and facts?*

4	3	2	1	NS
You provided convincing support/evidence for your main idea and included appropriate sources, facts, & details.	**You provided adequate support/evidence for your main idea and only limited sources, facts, & details.**	**You provided only modest support/ evidence for your main idea and it was not strengthened by sources, facts, & details.**	**You provided almost no support/evidence for your main idea.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #4: Language & Conventions – you must use proper grammar, spelling, vocabulary, and other conventions of the English language

**in other words: *Did you limit mistakes and respond in a thorough and professional manner?*

4	3	2	1	NS
Your response was professional and you demonstrated a command of language conventions.	**Your response was mostly professional with limited errors related to language conventions.**	**Your response was rather sloppy with multiple errors related to language conventions.**	**Your response was completely sloppy and showed no effort to follow language conventions.**	**Your response was incoherent, off-topic, or unable to be read.**

Teacher Instruction Sheet

Problem-Based Scenario

Section ① - Stimulus Review

Section ② - Classroom Discussion

Section ③ - Student Response

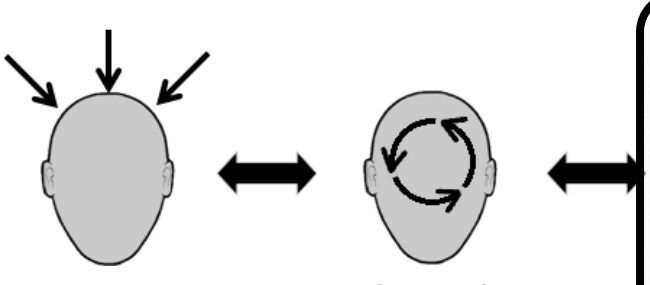
Section ④ - Grading & Analysis

Student Responses
("Product Option")

The Student Responses are Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

The 1-2-3 of Problem-Based Learning



Step 1	Step 2	Step 3
Absorb the information	**Evaluate the information**	**Generate the response**

The MATH ANGLE

It all leads up to this—***"The Product Option."*** It is here that students will have the "thinking muscle" truly stretched and those 21st Century Skills (collaboration, communication, technology, and so on) will be finely tuned.

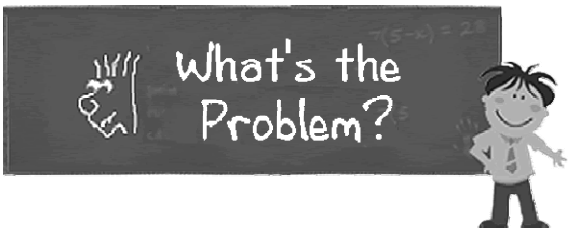
Let's start with a very simple definition:

The Product Option – where students are asked to "produce" something

Yes, this is very broad, and could include any of the following (and so much more):

Bulletin Board	Advertisement	Chart	Role Play	Tips / Suggestions
Letter	Cartoon	Pop-up / Child Book	Commercial	Slogan / Motto
Comic Strip	Play	Collage	Riddles / Jokes	Marketing Plan
Movie Trailer	Poster / Artwork	Timeline	Graphic Organizer	Jingle
Demonstration	Political Cartoon	Prototype	Brochure	Campaign Platform
Diary Entry	Costume	Crossword Puzzle	Poem	Experiment
Editorial Essay	Newspaper Article	Database / Spreadsheet	Rap Song	Mosaic
Map	Diorama	Oral Report	Webpage	Argument
Lesson Plan	Display	Rebus Story	Instruction Manual	Proposal
Fiction story	Mock Interview	Slide Show	Petition	Illustrated Story
Interview	Survey	Recipe / Instructions	Game	Radio show

After you divide your students into teams, photocopy the next page to outline the Product Option for this scenario.

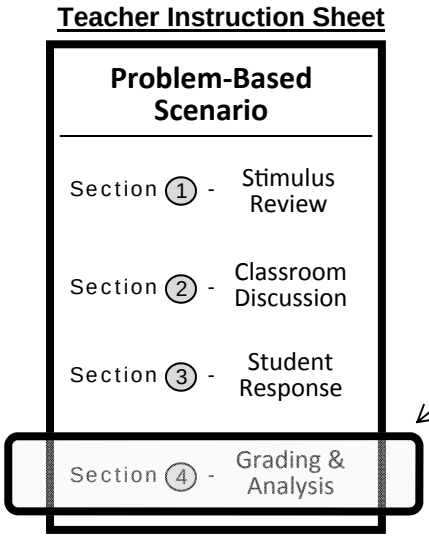


The task at hand...

Working to produce something as a team can help you gain a better understanding of the problem-scenario. Please work together on the exercise below:

Your group is the **Research Team** for a large magazine publisher. You have been given the task of creating a survey to determine whether your magazine should switch to an online format, or continue printing and delivering magazines to your customers' doors. You must make a list of questions for the survey that will result in the correct data that will be needed to make the decision.

As a class, you will discuss why certain questions have been chosen, and create a "Master List" of the best questions. Take this survey with your classmates and **analyze the results**. What does it suggest the correct course of action should be for the company? Is there any way that the survey results might be deceiving as to the best strategy for the company?



Grading Rubric
(Product Option)

The Grading Rubric is Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

We mention this time and time again through this book, and it's worth saying another time:

It's all about the process.

The purpose of these exercises is to allow students to think through problems and situations, and it's the teacher's role to guide them through the journey.

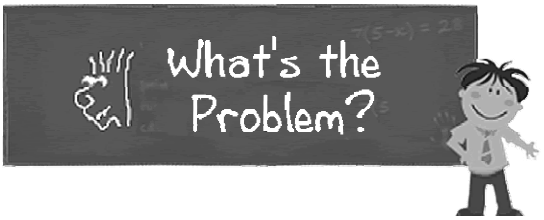
Without a doubt, your students will remind you that "it's all about the process" when they try to convince you to be gentle during the grading process. After all, they've been brought up to bubble in the correct circle with a #2 pencil, so to being asked to "produce" something from a variety of information can be tricky. But they'll do just fine.

As students work through the process, they will learn subject-specific skills and cover a few important standards. Yet they'll also be developing those 21st century skills and lifelong traits that we mention throughout this book (a few are listed below).

- **Critical Thinking**
- **Collaboration**
- **Entrepreneurialism**
- **Patience / Perseverance**
- **Researching**
- **Leadership**
- **Self-Direction**
- **Listening**
- **Creativity**
- **Technological Ability**
- **Internet / Media Literacy**
- **Healthy Skepticism**
- **Planning**
- **Social Awareness**
- **Data Analysis**
- **Imagination**
- **Communication**
- **Scientific Literacy**
- **Personal Expression**
- **Flexibility / Adaptability**

It's difficult to put a hard grade on any of those, and it isn't the final goal. If you live by the mantra, "*It's all about the process,*" these skills will indeed be developed. With that said, you do want to provide worthwhile feedback to your students. We use a simple—but sound—rubric to help students "ace the **TEST**" (a clever acronym to help them remember the key steps). The rubric is provided to the right for your convenience.

Photocopy this scoring sheet for your students to review.



How do I get an A?

As you work in teams on this exercise, you will be evaluated to see if you ace the **TEST:**:

Thoroughness
Evidence
Strategy
Teamwork

Thoroughness

_____ **The group completed all of the required tasks** (15 points)

_____ **Everyone followed directions throughout the process** (15 points)

Evidence

_____ **The group's final product was logical and could be defended** (15 points)

_____ **A variety of evidence was provided to support the product** (10 points)

Strategy

_____ **The group kept its focus on the requirements of the product** (15 points)

_____ **The group used a sound approach in completing the exercise** (10 points)

Teamwork

_____ **Everyone in the group participated and played a key role** (10 points)

_____ **All members of the group worked well together** (10 points)

Shown above are general areas that your teacher will be evaluating as he or she scores the products you create with your team. You may be provided more details about what it takes to receive the full value in any one of these areas.

Section 3:

"The Science Angle"

Teacher Instruction Sheet

The Main Problem Scenario:

You are a the owner of a magazine publishing company. Should you publish your magazines online, or continue to print and deliver them to your customers' doors?

The "Science Angle":

Is reading an online magazine better for the environment than reading a print version?

The SCIENCE ANGLE

*Your **Teacher Instruction** page is shown to the right. A unique Teacher Instructions sheet is created for each "subject angle" of the Main Problem Scenario, and walks through the entire process of viewing the problem from that point-of-view. Everything that is referenced in the Teacher Instructions (student stimulus items, classroom discussion sheets, thought-gathering sheets, rubrics) will be provided as you work through the exercise.*

Make a photocopy of the Teacher Instructions to walk you through the entire "science angle"

Teacher Instructions:

"Print vs. Online Magazines"

Problem Scenario: **You are the owner of a magazine publishing company that is under pressure to thrive as the industry quickly changes. You must decide between publishing your magazines online, or continuing to print and deliver them each week to your customers' doors. What are the issues involved, and what is best for the company?**

Your students will be viewing this problem from an SCIENCE perspective.

Is reading an online magazine better for the environment than reading a print version?

Students must determine if there is any environmental gain or loss associated with the switch from magazines to the internet. They will also decide how much this should influence the actions of publishing companies.

Step 1 — Review Stimulus Items

Stimulus Item #1 — Print Media, Internet, & the Environment (video)

Stimulus Item #2 — "Companies & Social Responsibility" (editorial)

Stimulus Item #3 — "Are Magazines Bad for the Environment?" (blog)

***Students should take notes as they review the Stimulus Items*

Step 2 — Classroom Discussion

Lead a **class discussion** about issues related to the topic.
You are being provided a sheet to help you guide the classroom discussion.

Step 3 — Student Response

Extended Response: Have students answer the following questions. Remind students to use information from the Stimulus Items to support their response.

1) **Is it better for the environment to read online magazines or print magazines? Why?**
2) **Should a publishing company consider the environment when it's making a business decision about its magazine format (print vs. online)? What if doing what is best for the environment causes the company to lose money and customers?**

Product Option: Divide your students into groups. Some groups will take on the role of a magazine publishers, and the others will be the owner of a large internet publishing company. Their task is to prepare for an interview about the company they represent. They are asked the question, "How is using your product [a print magazine or an online magazine] better for the environment than the alternative?" They must be ready to give good reasons (have them answer in front of the class, who is acting as the "in-studio audience"). Make sure to ask tough follow-up questions like "Don't you think delivering magazines is a waste of gas?" or "Did you know it takes centuries for a computer to biodegrade?" to see how well students are prepared.

****students should have access to their notes as they enter their answers*

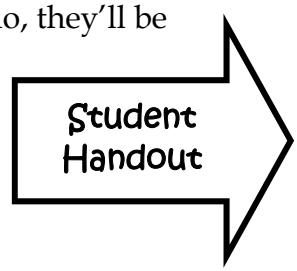
****students may also have access to the Stimulus Items as they enter their answers*

Step 4 — Analysis

Rubrics to grade student entries have been provided, and all questions have been mapped to the content standards.

Science Standards

As students work through this section of our Problem-Based Scenario, they'll be focusing on several science content areas. This includes:



- **Ecosystems and the Environment**
- **Impact of Human Activity on the Earth**

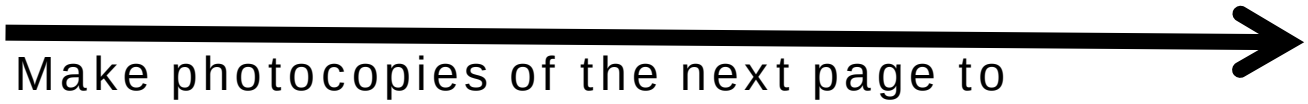
In addition—and perhaps more importantly—students will need to take on a scientific frame of mind (in academic circles, these are referred to as the "Science and Engineering Practices"), which is a key benefit of Problem-Based Learning. This means that students will need to:

- **Asking questions and define problems.**
- **Constructing explanations and designing solutions.**
- **Engaging in argument from evidence.**
- **Obtaining, evaluating, and communicating information**

You may want to share the goals listed above with your students prior to beginning the exercise, but the best part is that they'll be developing these skills whether they realize it or not!

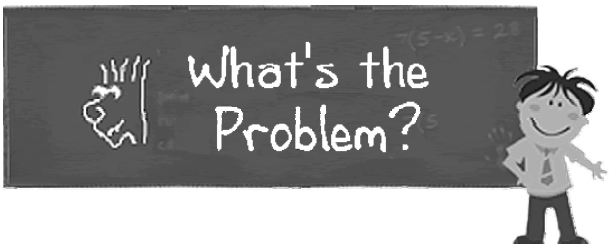
The most important thing to remember when introducing the Problem-Based Scenario is to grab student interest right away. It is a fun and challenging exercise, and you certainly want students to approach it that way.

To make this easy for you, we have created a handout to introduce the "math angle" to your students for this Problem-Based Scenario. This will help them see that they will be looking at the Main Problem Scenario from a specific point-of-view, in this case with a mathematical focus.



Make photocopies of the next page to introduce the "Science Angle" of this Problem-Scenario to your students

The SCIENCE ANGLE



Are you ready to tackle the problem?

The Scenario:

You are the owner of a magazine publishing company that is under pressure to thrive as the industry quickly changes. You must decide between publishing your magazines online, or continuing to print and deliver them each week to your customers' doors. What are the issues involved, and what is best for the company?

In order to properly respond to a complicated problem like the one above, you must view it from different points-of-view. In this case, we will consider the following:

Something to think about:

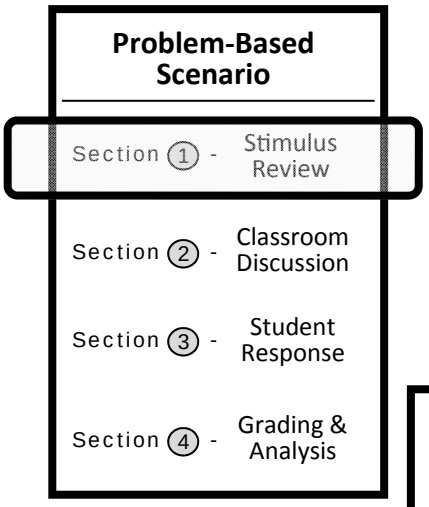
Is reading an online magazine better for the environment than reading a print version?

Prior to giving your response, you will review multiple resources, engage in classroom discussion, and take time to organize your thoughts.

In this exercise, you will determine if there is any environmental gain or loss associated with the switch from magazines to the internet. You will also decide how much this should influence the actions of publishing companies.

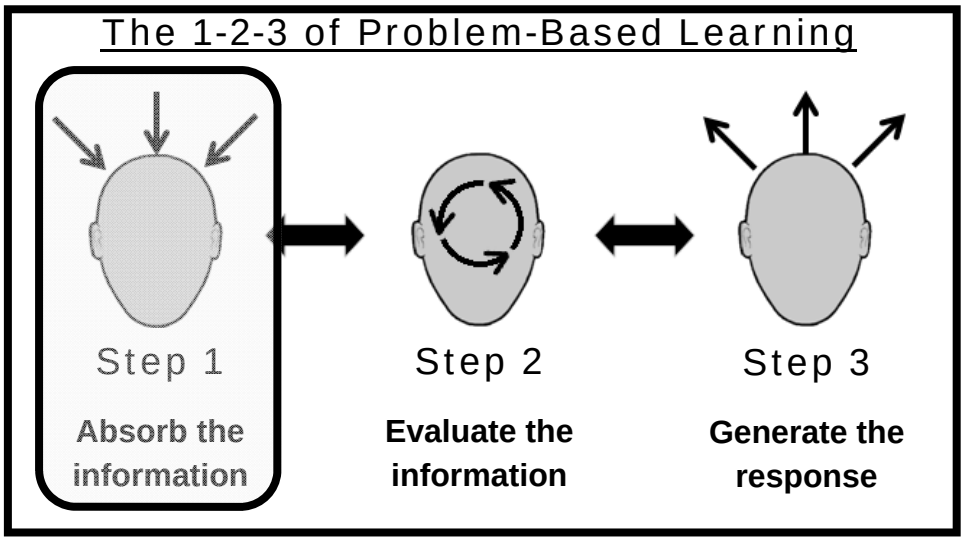
★ *As you work on this exercise, remember that this is primarily a **science question**. This means that scientific facts and a healthy skepticism will be needed to support your ideas!*

Teacher Instruction Sheet



Stimulus Review

The Stimulus Review is Section 1 *on your* ***Teacher Instruction Sheet.***



The SCIENCE ANGLE

It's a fancy term, but the "Stimulus Review" is simply the first step in Problem-Based Learning where students review a variety of information surrounding the specific problem or challenge.

In our Problem Scenario, all of the Stimulus Items have been provided for you. We have intentionally gathered a variety of different types and sources. This is important in today's modern world where information comes from all directions, and also sets the stage for Step 2 (Evaluating the Information).

A few examples of the types of Stimulus Items you might see in a Problem-Based Scenario include:

- **Articles**
- **Videos**
- **Infographics**
- **Blogs**
- **Statistics**
- **Lists**
- **Websites**
- **Editorials**
- **Audio Recordings**
- **Cartoons**
- **Primary Sources**
- **Advertisements**

…and much more!

For your convenience, we've placed all of the Stimulus Items for this Problem-Based Scenario on a special website where **both you and your students** can have full access to them. To access these resources, you will go to:

http://www.pblproject.com/students

Login:
Password:

The Stimulus Items you'll see for this section of the exercise include:

Stimulus Item #1

— Print Media, Internet, & the Environment (video)

Stimulus Item #2

— "Companies & Social Responsibility" (editorial)

Stimulus Item #3

— "Magazines Bad for the Environment?" (blog)

A Few Notes:

There are a couple of things we'd like to highlight as your students get ready to dive into the Stimulus Items. First, these are actual sources that have been gathered for the topic at hand, even if they have been edited or adapted at times due to length, format, or readability. That means that they don't necessarily reflect our personal opinions, and we certainly don't want to take credit for the hard work of others (all source information will be provided). It does, however, provide a nice mix for your students.

Next, the Stimulus Items should give your students the background information they need to generate their responses to the Problem-Based Scenario. There is no need for you to seek out other resources or for students to do their own research.

With that said, it is always great if there is an opportunity for students to get on a computer or head to the library to find their own background information. Being able to conduct your own research is a vital skill to have, and it is referenced throughout Language Arts standards.

Again, this extra step is not necessary to successfully go through the exercise (we know you're already crunched for time!), but we figured it was worth mentioning!

Teacher Instruction Sheet

Problem-Based Scenario

Section 1 - Stimulus Review

Section 2 - Classroom Discussion

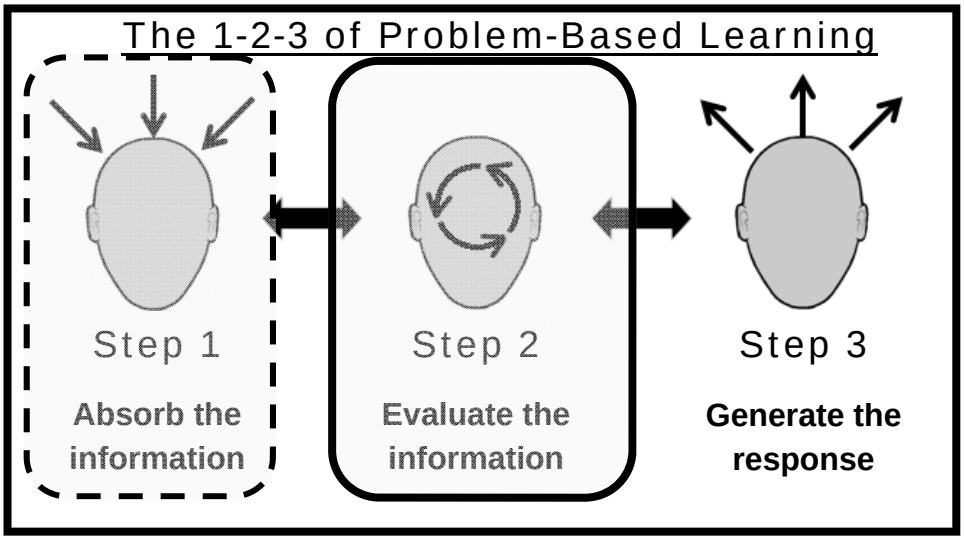
Section 3 - Student Response

Section 4 - Grading & Analysis

Classroom Discussion

The Classroom Discussion is Section 2 *on your* ***Teacher Instruction Sheet.***

Teacher "Quick Sheet"

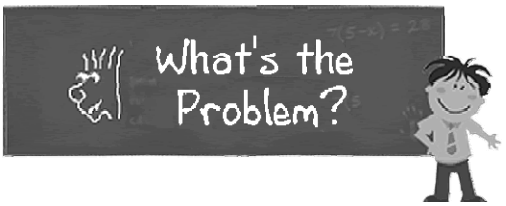


The SCIENCE ANGLE

Now that your students have reviewed the Stimulus Items, it is a fitting time to have a **class discussion** about the Problem-Based Scenario (specifically, the "subject angle" that you're working with).

At this stage, there will be a limited amount of new information brought to the table (Step 1), although you might want to introduce ideas not covered in the Stimulus, and perhaps students will share original thoughts and experiences. For the most part, though, the classroom discussion is where you want students to evaluate the information (Step 2) to which they've been exposed. It is now that they will begin to organize it all and decide how it will fit together in their response.

The key to a classroom discussion, of course, is keeping everything focused and moving it in the direction you want, and at the same time creating a free environment for students to share and build on ideas. This is certainly where teachers earn their pay! One way we've tried to help (a little bit, at least) is to provide you with the talking points that work well for this scenario. The bold questions are what you will ask your students, and each has bullet points that you can use to guide the discussion.



Leading Questions for Classroom Discussion

Print vs. Online Magazines (science angle)

Is it better for the environment to get read a print magazines or from an online magazine?

- Consider that magazines do result in more solid waste… however, most magazine material is recyclable and it is all quickly biodegradable (so the impact to the environment is greatly limited)
- Consider that computers take hundreds of years to biodegrade, so they have their own environmental issues… however, most people would have computers even if they didn't use them to get news
- Consider other factors that might not be so obvious, such as gas used to deliver papers

Do people think about the environment when they make everyday decisions (such as whether to get a magazine)?

- Consider how everybody has different priorities, and it's often hard to measure the environmental impact of people's decisions
- Consider how one person's efforts may be very small and impossible to see… however, they become more significant if everyone "chips in"
- Consider how there is a difference between a "reasonable" sacrifice (such as closing the windows when the heat is running) and an "unreasonable" sacrifice (such as riding bikes instead of driving in cars)

What level of concern about the environment should be expected from the publishing company?

- Consider how a publishing company has to focus on its main area of business—giving people access to the news, content, and other information
- Consider how taking care of the environment is a "moral" obligation, and it can also be good business (i.e. customers like to know they're dealing with a responsible company)
- Consider what is "reasonable" (i.e. using recyclable magazine or offering online versions of the paper) versus what is "unreasonable" (i.e. giving electric cars to all of the people delivering the magazines)

Teacher Instruction Sheet

Problem-Based Scenario

Section ① - Stimulus Review

Section ② - Classroom Discussion

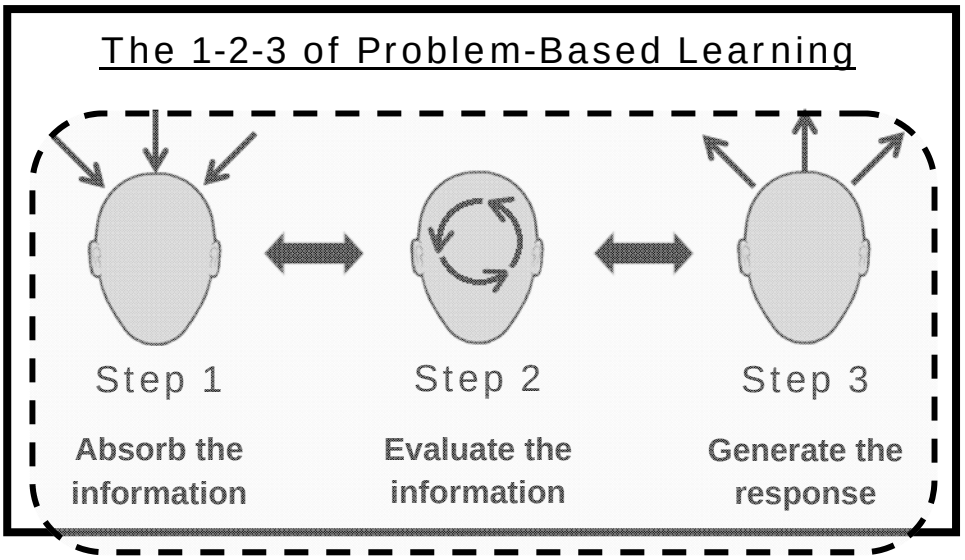
Section ③ - Student Response

Section ④ - Grading & Analysis

"Thought-Gathering" Sheet

The "Thought-Gathering" Sheet is an interim step prior to the student responses.

Student Handout



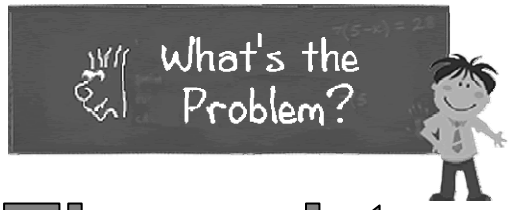
The SCIENCE ANGLE

So, by this point, you've had students review Stimulus Items related to the Problem Scenario. That led to a stimulating (we hope) classroom discussion on the topic.

Often times, there is a feeling of "information overload" at this stage. Students have enough information to generate their constructed responses and/or fulfill their product options (we'll talk about these on the upcoming pages), but their thoughts may be all over the place. They may still have to pick their position, refine their arguments, focus their proposal, perfect their design… and so on.

That's where the **"Thought-Gathering" Sheet** comes in. This isn't to be confused with any "note-taking sheets" your students may have written while they were looking through the Stimulus Items or listening to the discussion. Rather, this is a final stage where they sort everything (including their own notes) to prepare for their response. It is a chance to tie together Step 1, Step 2, and Step 3 (shown above).

We have provided a "Thought-Gathering" sheet that works with this exercise and is a good chance for students to organize their ideas prior to creating their responses.



Thoughts on the environmental impact of the news:

Topic:

Key Point:

- **Supporting Details:**

Key Point:

- **Supporting Details:**

Key Point:

- **Supporting Details:**

Key Point:

- **Supporting Details:**

Notes:
(use this space to write things you want to remember)

Teacher Instruction Sheet

Problem-Based Scenario

Section 1 - Stimulus Review

Section 2 - Classroom Discussion

Section 3 - Student Response

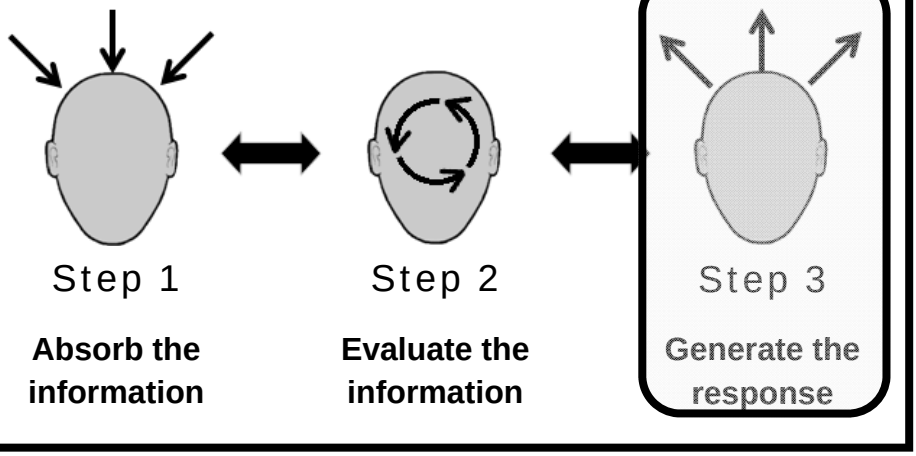
Section 4 - Grading & Analysis

Student Responses
(Extended Response)

The Student Responses are Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

The 1-2-3 of Problem-Based Learning



The SCIENCE ANGLE

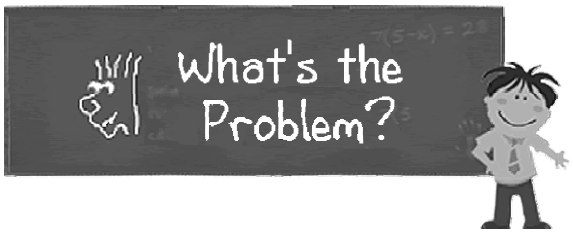
On your Teacher Instruction sheet, you'll see that each scenario provides two types of response options for your students—Extended Responses and the Product Option. Let's look at the **"Extended Responses"** first.

As you would expect, the Extended Responses are simply questions centering around the Problem-Based Scenario that the students answer through their writing.

Most likely, the Extended Responses are similar to what you might see during a Performance Task of a comprehensive assessment (where students are given a range of information to review, and then must give their conclusions based on the evidence). The "test prep" benefits alone make it worthwhile for students to complete the Extended Responses, but the broader benefit is their ability to take the information they've been exposed to and generate a logical response to a problem scenario.

The rubric and process for grading Extended Responses is on the following pages. Also, we will leave it up to you whether you want to allow students to use notes they have taken throughout (we think it's fine for them to do so), and also how strict you want to be with time limits (a half hour or so should be fine).

Here are the Extended Response questions for this scenario.



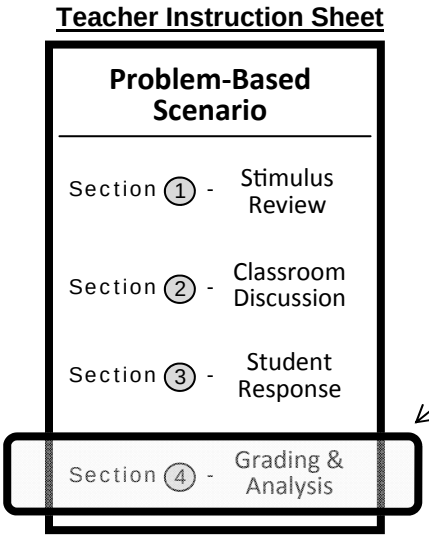
What do you think?

The questions below are centered around the Problem-Based Scenario you've been reviewing. Please answer the questions on separate sheets of paper.

1) **Is it better for the environment to read online magazines or to read print magazines? Why?**

2) **Should a publishing company consider the environment when it's making a business decision about its magazine format (print vs. online)? What if doing what is best for the environment causes the company to lose money and customers?**

★ *Remember to support your answers with evidence that you've gathered from what you've read and discussed in class!*



Grading Rubric
(Extended Responses)

The Grading Rubric is Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

The SCIENCE ANGLE

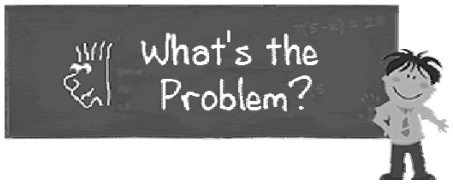
One thing that your students must understand about these Problem-Based Scenarios is that the answer is never "yes" or "no". Instead, students must think their way through the muddy waters of different situations and challenges, while you guide them along the journey.

Of course, the end result needs to be more than a pat on the back—and that's why proper grading is so important. While students may feel that grades exist only to cause stress and fill the blank spaces on a report card, the broader reason is that when students are graded in a clear and fair way, it enables them to continually improve their approach and response.

The Extended Responses for this scenario can be graded using the rubric to the right. It is divided into four sections:

1) Science Content (*What do you want students to bring to the table based on previous lessons?)*
2) Writing Focus *(Was it clear what point the students were trying to make?)*
3) Use of Evidence *(Did the students back up their position with evidence, quotes, statistics, and facts?)*
4) Language & Conventions (*Did students limit mistakes and respond in a thorough and*

Here is a copy of the rubric for your students to review.



How do I get an A?

Listed below are the four different areas that will be evaluated as your responses are graded. Be sure to consider each area as you write.

Rubric Section #1: Science Content – you must show a high level of background knowledge and general understanding of the topic

**in other words: *What are you bringing to the table based on previous lessons?*

4	3	2	1	NS
You proved throughout your response to have a high level of background knowledge of the subject.	**You showed a reasonable level of background knowledge through most of your response.**	**You showed a limited level of background knowledge, and only in certain parts of your response.**	**You showed barely any background knowledge of the subject throughout your response.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #2: Production & Distribution of Writing – you must organize and sustain your writing based on a defined purpose

**in other words: *Was it clear what point you were trying to make, and did you focus on that point?*

4	3	2	1	NS
Your response had a defined purpose, and it was organized with a clear focus on that purpose.	**Your response had a defined purpose, although it lacked organization and a clear focus on that purpose.**	**The purpose of your response was a bit vague, and there was limited organization and focus.**	**There was no defined purpose or organization to your response.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #3: Integration of Knowledge and Ideas (use of "evidence") – you must support your arguments and positions with outside information (i.e. "stimulus items")

**in other words: *Did you back up your position with evidence, quotes, statistics, and facts?*

4	3	2	1	NS
You provided convincing support/evidence for your main idea and included appropriate sources, facts, & details.	**You provided adequate support/evidence for your main idea and only limited sources, facts, & details.**	**You provided only modest support/ evidence for your main idea and it was not strengthened by sources, facts, & details.**	**You provided almost no support/evidence for your main idea.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #4: Language & Conventions – you must use proper grammar, spelling, vocabulary, and other conventions of the English language

**in other words: *Did you limit mistakes and respond in a thorough and professional manner?*

4	3	2	1	NS
Your response was professional and you demonstrated a command of language conventions.	**Your response was mostly professional with limited errors related to language conventions.**	**Your response was rather sloppy with multiple errors related to language conventions.**	**Your response was completely sloppy and showed no effort to follow language conventions.**	**Your response was incoherent, off-topic, or unable to be read.**

Teacher Instruction Sheet

Problem-Based Scenario

Section 1 - Stimulus Review

Section 2 - Classroom Discussion

Section 3 - Student Response

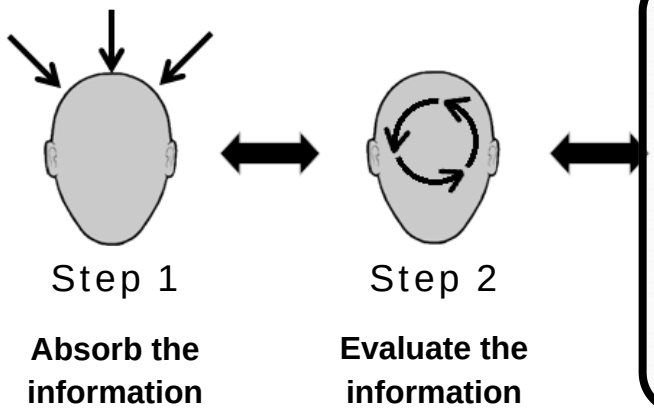
Section 4 - Grading & Analysis

Student Responses
("Product Option")

The Student Responses are Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

The 1-2-3 of Problem-Based Learning



The SCIENCE ANGLE

It all leads up to this—***"The Product Option."*** It is here that students will have the "thinking muscle" truly stretched and those 21st Century Skills (collaboration, communication, technology, and so on) will be finely tuned.

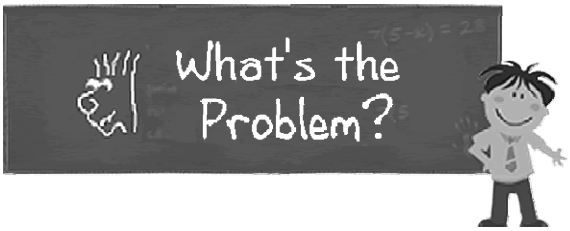
Let's start with a very simple definition:

The Product Option – where students are asked to "produce" something

Yes, this is very broad, and could include any of the following (and so much more):

Bulletin Board	Advertisement	Chart	Role Play	Tips / Suggestions
Letter	Cartoon	Pop-up / Child Book	Commercial	Slogan / Motto
Comic Strip	Play	Collage	Riddles / Jokes	Marketing Plan
Movie Trailer	Poster / Artwork	Timeline	Graphic Organizer	Jingle
Demonstration	Political Cartoon	Prototype	Brochure	Campaign Platform
Diary Entry	Costume	Crossword Puzzle	Poem	Experiment
Editorial Essay	Newspaper Article	Database / Spreadsheet	Rap Song	Mosaic
Map	Diorama	Oral Report	Webpage	Argument
Lesson Plan	Display	Rebus Story	Instruction Manual	Proposal
Fiction story	Mock Interview	Slide Show	Petition	Illustrated Story
Interview	Survey	Recipe / Instructions	Game	Radio show

After you divide your students into teams, photocopy the next page to outline the Product Option for this scenario.



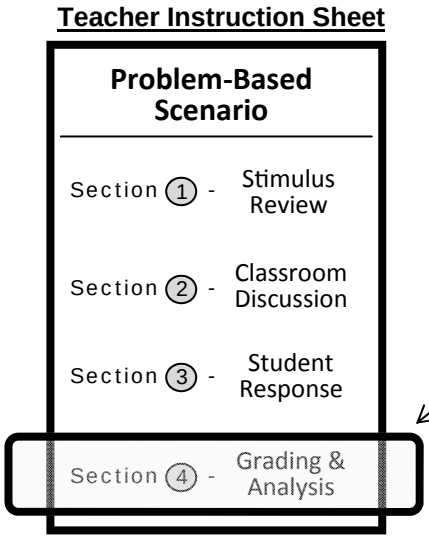
The task at hand...

Working to produce something as a team can help you gain a better understanding of the problem-scenario. Please work together on the exercise below:

Your task is to **prepare for an interview** about the company your group represents (you have been assigned to either a large magazine company or an internet company).

The topic of the environment will certainly arise, so be prepared to answer the question, “How is using your product [a print magazine or an online magazine] better for the environment than the alternative?” You must be ready to give good reasons (the interview will take place in front of the class, who is acting as the “in-studio audience”).

Be ready to answer tough follow-up questions to see how well you are prepared?



Grading Rubric
(Product Option)

The Grading Rubric is Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

The SCIENCE ANGLE

We mention this time and time again through this book, and it's worth saying another time:

It's all about the process.

The purpose of these exercises is to allow students to think through problems and situations, and it's the teacher's role to guide them through the journey.

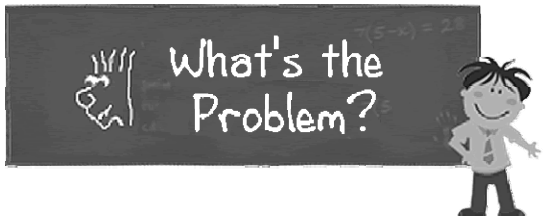
Without a doubt, your students will remind you that "it's all about the process" when they try to convince you to be gentle during the grading process. After all, they've been brought up to bubble in the correct circle with a #2 pencil, so to being asked to "produce" something from a variety of information can be tricky. But they'll do just fine.

As students work through the process, they will learn subject-specific skills and cover a few important standards. Yet they'll also be developing those 21st century skills and lifelong traits that we mention throughout this book (a few are listed below).

- **Critical Thinking**
- **Researching**
- **Creativity**
- **Planning**
- **Communication**
- **Collaboration**
- **Leadership**
- **Technological Ability**
- **Social Awareness**
- **Scientific Literacy**
- **Entrepreneurialism**
- **Self-Direction**
- **Internet / Media Literacy**
- **Data Analysis**
- **Personal Expression**
- **Patience / Perseverance**
- **Listening**
- **Healthy Skepticism**
- **Imagination**
- **Flexibility / Adaptability**

It's difficult to put a hard grade on any of those, and it isn't the final goal. If you live by the mantra, *"It's all about the process,"* these skills will indeed be developed. With that said, you do want to provide worthwhile feedback to your students. We use a simple—but sound—rubric to help students "ace the **TEST**" (a clever acronym to help them remember the key steps). The rubric is provided to the right for your convenience.

Photocopy this scoring sheet for your students to review.



How do I get an A?

As you work in teams on this exercise, you will be evaluated to see if you ace the **TEST:**:

Thoroughness
Evidence
Strategy
Teamwork

Thoroughness

_____ **The group completed all of the required tasks** (15 points)

_____ **Everyone followed directions throughout the process** (15 points)

Evidence

_____ **The group's final product was logical and could be defended** (15 points)

_____ **A variety of evidence was provided to support the product** (10 points)

Strategy

_____ **The group kept its focus on the requirements of the product** (15 points)

_____ **The group used a sound approach in completing the exercise** (10 points)

Teamwork

_____ **Everyone in the group participated and played a key role** (10 points)

_____ **All members of the group worked well together** (10 points)

Shown above are general areas that your teacher will be evaluating as he or she scores the products you create with your team. You may be provided more details about what it takes to receive the full value in any one of these areas.

Section 3:

"The Social Studies Angle"

Teacher Instruction Sheet

The Main Problem Scenario:

You are a the owner of a magazine publishing company. Should you publish your magazines online, or continue to print and deliver them to your customers' doors?

The "Social Studies Angle":

How is media changing, and what does it mean for the future?

The SOCIAL STUDIES ANGLE

*Your **Teacher Instruction** page is shown to the right. A unique Teacher Instructions sheet is created for each "subject angle" of the Main Problem Scenario, and walks through the entire process of viewing the problem from that point-of-view. Everything that is referenced in the Teacher Instructions (student stimulus items, classroom discussion sheets, thought-gathering sheets, rubrics) will be provided as you work through the exercise.*

Make a photocopy of the Teacher Instructions to walk you through the entire "SS angle"

Teacher Instructions:

"Print vs. Online Magazines"

Problem Scenario: **You are the owner of a magazine publishing company that is under pressure to thrive as the industry quickly changes. You must decide between publishing your magazines online, or continuing to print and deliver them each week to your customers' doors. What are the issues involved, and what is best for the company?**

Your students will be viewing this problem from an SCIENCE perspective.

How is media changing, and what does it mean for the future?

Students will review the rise and importance of mass media, and understand how it has changed over the years (and in what ways it will continue to change). They must decide how these trends should influence the actions of publishing companies.

Step 1
Review Stimulus Items

Stimulus Item #1 — "Print Media vs. the Internet" (pros / cons)

Stimulus Item #2 — "How is Media Changing?" (article)

Stimulus Item #3 — "The Future of Media" (online discussion forum)

***Students should take notes as they review the Stimulus Items*

Step 2
Classroom Discussion

Lead a **class discussion** about issues related to the topic.
You are being provided a sheet to help you guide the classroom discussion.

Step 3
Student Response

Extended Response: Have students answer the following questions. Remind students to use information from the Stimulus Items to support their response.

1) **How are people gaining access to "mass media" differently now than in the past? Does this change the influence of mass media on our society?**

2) **Should a publishing company consider changes in mass media when it's making a business decision about magazine format (print vs. online)? What should be the major trends that will determine the company's decision?**

******students should have access to their notes as they enter their answers***

******students may also have access to the Stimulus Items as they enter their answers***

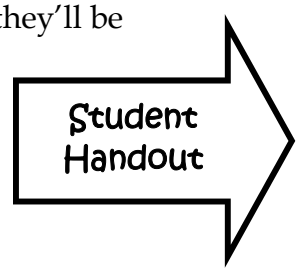
Product Option: Divide your students into small groups to form the **Editorial Staff** for a magazine publisher (they can decide on the magazine them). They must consider the news and hot topics of the day, and decide what is worthy of being placed in their magazine. When a topic is chosen, they must **design the layout** for their magazine. This means creating the first page for the article if it is a printed magazine, or the introductory webpage if it is an online magazine. As a class, discuss how a magazine company might customize a trending topic to fit its customer base, and whether this has any influence on the medium (i.e. print, online, phone app, etc.) that is used to deliver the magazine. How does the format determine the level of customer satisfaction with the magazine and its content?

Step 4
Analysis

Rubrics to grade student entries have been provided, and all questions have been mapped to the content standards.

Social Studies Standards

As students work through this section of our Problem-Based Scenario, they'll be focusing on several science content areas. This includes:



- **The impact of mass media**
- **The influence of technology on society**
- **The concept of supply and demand**

The SOCIAL STUDIES ANGLE

In addition—and perhaps more importantly—students will need to understand basic principles of social studies, which is a key benefit of Problem-Based Learning. This means that in addition to the basic disciplinary standards, students will become familiar with the broader themes of social studies. For example:

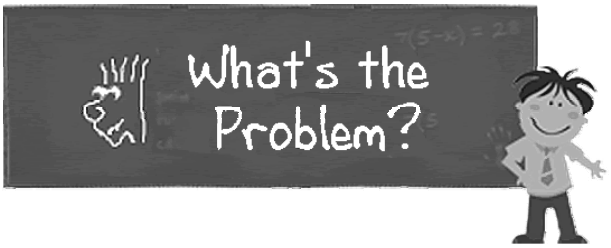
- **Culture and Cultural Diversity**
- **Time, Continuity, and Change**
- **People, Places, and Environments**
- **Individual Development and Identity**
- **Individuals, Groups, and Institutions**
- **Power, Authority, and Governance**
- **Production, Distribution, and Consumption**
- **Science, Technology, and Society**
- **Global Connections**
- **Civic Ideals and Practices**

You may want to share the themes listed above with your students prior to beginning the exercise, but the best part is that they'll be developing this broader understanding whether they realize it or not!

The most important thing to remember when introducing the Problem-Based Scenario is to grab student interest right away. It is a fun and challenging exercise, and you certainly want students to approach it that way.

To make this easy for you, we have created a handout to introduce the "math angle" to your students for this Problem-Based Scenario. This will help them see that they will be looking at the Main Problem Scenario from a specific point-of-view, in this case with a mathematical focus.

Make photocopies of the next page to introduce the "Social Studies Angle" of this Problem-Scenario to your students



Are you ready to tackle the problem?

The Scenario:

You are the owner of a major newspaper company that is under pressure to thrive as the industry quickly changes. You must decide between publishing your newspapers online, or continuing to deliver paper copies to your customers' doors. What are the issues involved, and what is best for the company?

In order to properly respond to a complicated problem like the one above, you must view it from different points-of-view. For example, we will consider the following:

Something to think about:

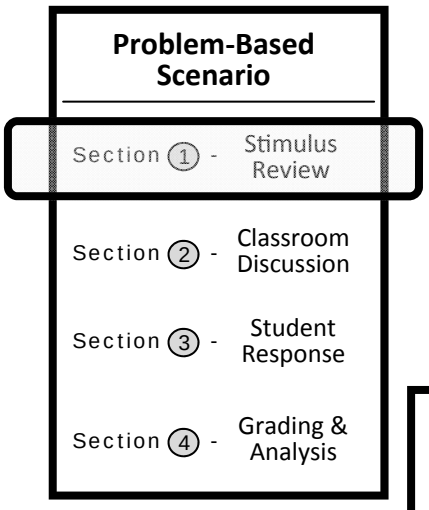
How is media changing, and what does it mean for the future?

Prior to giving your response, you will review multiple resources, engage in classroom discussion, and take time to organize your thoughts.

In this exercise, you will analyze survey data to determine how people prefer to get their news (newspaper or internet). You will also review whether the medium has an impact on how much people are willing to pay.

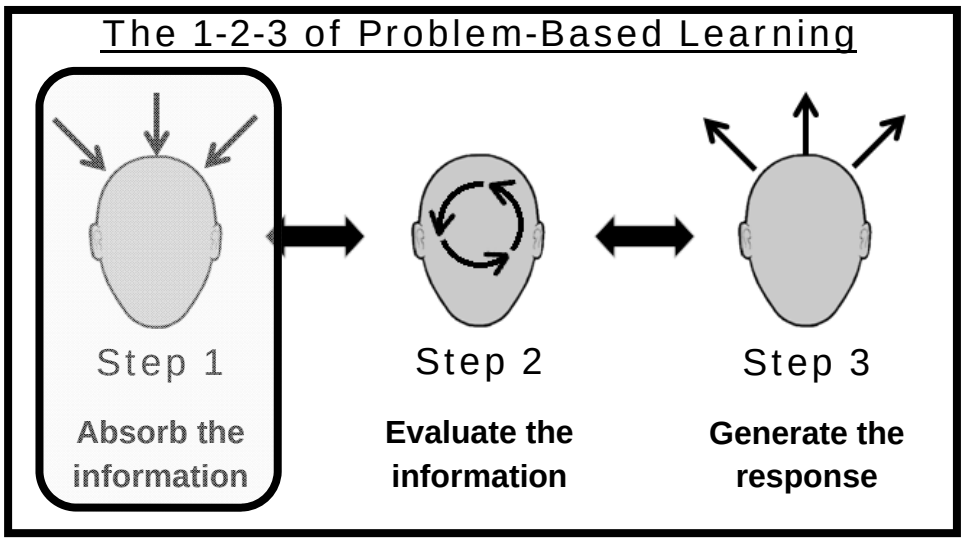
★ *As you work on this exercise, remember that this is primarily a* ***social studies question****. This means that you must consider historical and current trends in our society, along with other political and economic factors, when providing your response.*

Teacher Instruction Sheet



Stimulus Review

The Stimulus Review is Section 1 *on your* ***Teacher Instruction Sheet.***



The SOCIAL STUDIES ANGLE

It's a fancy term, but the "Stimulus Review" is simply the first step in Problem-Based Learning where students review a variety of information surrounding the specific problem or challenge.

In our Problem Scenario, all of the Stimulus Items have been provided for you. We have intentionally gathered a variety of different types and sources. This is important in today's modern world where information comes from all directions, and also sets the stage for Step 2 (Evaluating the Information).

A few examples of the types of Stimulus Items you might see in a Problem-Based Scenario include:

- **Articles**
- **Videos**
- **Infographics**
- **Blogs**
- **Statistics**
- **Lists**
- **Websites**
- **Editorials**
- **Audio Recordings**
- **Cartoons**
- **Primary Sources**
- **Advertisements**

...and much more!

For your convenience, we've placed all of the Stimulus Items for this Problem-Based Scenario on a special website where **both you and your students** can have full access to them. To access these resources, you will go to:

http://www.pblproject.com/students

Login:
Password:

The Stimulus Items you'll see for this section of the exercise include:

Stimulus Item #1

— "Print Media vs. the Internet" (pros / cons)

Stimulus Item #2

— "How is Media Changing?" (article)

Stimulus Item #3

— "Future of Media" (online discussion forum)

A Few Notes:

There are a couple of things we'd like to highlight as your students get ready to dive into the Stimulus Items. First, these are actual sources that have been gathered for the topic at hand, even if they have been edited or adapted at times due to length, format, or readability. That means that they don't necessarily reflect our personal opinions, and we certainly don't want to take credit for the hard work of others (all source information will be provided). It does, however, provide a nice mix for your students.

Next, the Stimulus Items should give your students the background information they need to generate their responses to the Problem-Based Scenario. There is no need for you to seek out other resources or for students to do their own research.

With that said, it is always great if there is an opportunity for students to get on a computer or head to the library to find their own background information. Being able to conduct your own research is a vital skill to have, and it is referenced throughout Language Arts standards.

Again, this extra step is not necessary to successfully go through the exercise (we know you're already crunched for time!), but we figured it was worth mentioning!

Teacher Instruction Sheet

Problem-Based Scenario

Section 1 - Stimulus Review

Section 2 - Classroom Discussion

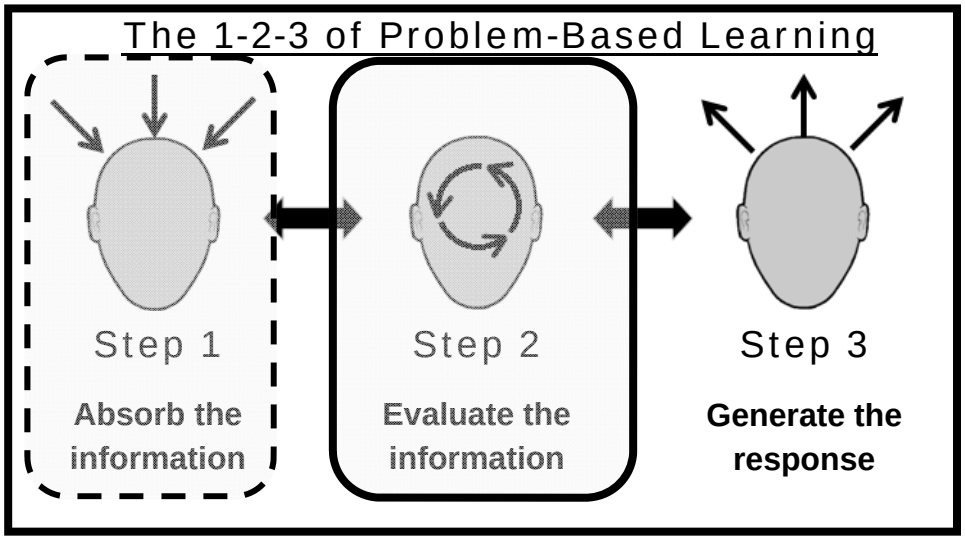
Section 3 - Student Response

Section 4 - Grading & Analysis

Classroom Discussion

The Classroom Discussion is Section 2 *on your* ***Teacher Instruction Sheet.***

Teacher "Quick Sheet"

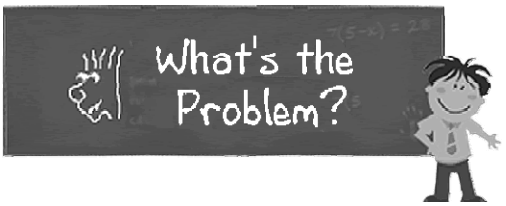


The SOCIAL STUDIES ANGLE

Now that your students have reviewed the Stimulus Items, it is a fitting time to have a **class discussion** about the Problem-Based Scenario (specifically, the "subject angle" that you're working with).

At this stage, there will be a limited amount of new information brought to the table (Step 1), although you might want to introduce ideas not covered in the Stimulus, and perhaps students will share original thoughts and experiences. For the most part, though, the classroom discussion is where you want students to evaluate the information (Step 2) to which they've been exposed. It is now that they will begin to organize it all and decide how it will fit together in their response.

The key to a classroom discussion, of course, is keeping everything focused and moving it in the direction you want, and at the same time creating a free environment for students to share and build on ideas. This is certainly where teachers earn their pay! One way we've tried to help (a little bit, at least) is to provide you with the talking points that work well for this scenario. The bold questions are what you will ask your students, and each has bullet points that you can use to guide the discussion.



Leading Questions for Classroom Discussion

Print vs. Online Magazines (social studies angle)

How do magazines and the Internet contribute to the spread of information?

- Consider how you learn about events that happen thousands of miles away, and the impact that this instant and mass media has
- Consider different sources people use to get their news (newspapers, magazines, TV, radio, internet, etc.), and which are the most instantaneous
- Consider how things would change if news took weeks to spread across the country, like it did a couple of centuries ago

How is the format of mass media changing? How will people get access to news and information in the future?

- Consider the common way to get news today (newspapers, magazines, TV, radio, internet, etc.), and which of these options is on the rise, and which is on the fall
- Consider how mobile devices, such as Smart Phones, have changed the way people access information, including what we call “news”
- Consider future innovations (such as “Google Glasses,” perhaps) that are not available yet, but have the potential to make a huge impact on how people access information

If a publishing company wants to be competitive, what formats should it use to distribute its information?

- Consider how a company needs to fit the preference of its customers, and this may vary depending on who those customers are (i.e. young people versus older people)
- Consider how all companies need to “change with the times” to be competitive, and what these changes may be in regards to how people access information
- Consider how cost and profit potential play a major part in how a company delivers its product, and it will only change if costs go down and profit goes up

Teacher Instruction Sheet

Problem-Based Scenario

Section ① - Stimulus Review

Section ② - Classroom Discussion

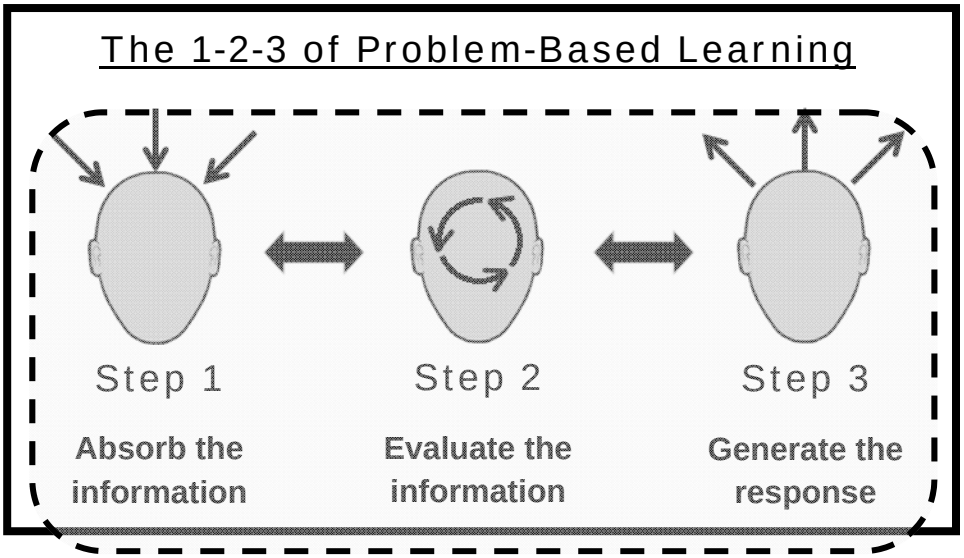
Section ③ - Student Response

Section ④ - Grading & Analysis

"Thought-Gathering" Sheet

The "Thought-Gathering" Sheet is an interim step prior to the student responses.

Student Handout



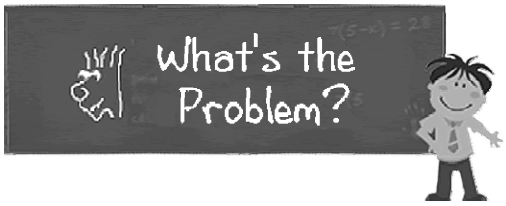
The SOCIAL STUDIES ANGLE

So, by this point, you've had students review Stimulus Items related to the Problem Scenario. That led to a stimulating (we hope) classroom discussion on the topic.

Often times, there is a feeling of "information overload" at this stage. Students have enough information to generate their constructed responses and/or fulfill their product options (we'll talk about these on the upcoming pages), but their thoughts may be all over the place. They may still have to pick their position, refine their arguments, focus their proposal, perfect their design… and so on.

That's where the **"Thought-Gathering" Sheet** comes in. This isn't to be confused with any "note-taking sheets" your students may have written while they were looking through the Stimulus Items or listening to the discussion. Rather, this is a final stage where they sort everything (including their own notes) to prepare for their response. It is a chance to tie together Step 1, Step 2, and Step 3 (shown above).

We have provided a "Thought-Gathering" sheet that works with this exercise and is a good chance for students to organize their ideas prior to creating their responses.



Changes in the way we get our news:

How was news delivered to the customer in the past?

↓

How is news delivered to the customer in modern times?

↓

How might news be delivered to the customer in the future?

↓

How does the way that people get their news influence news companies?

↓

Teacher Instruction Sheet

Problem-Based Scenario

Section 1 - Stimulus Review

Section 2 - Classroom Discussion

Section 3 - Student Response

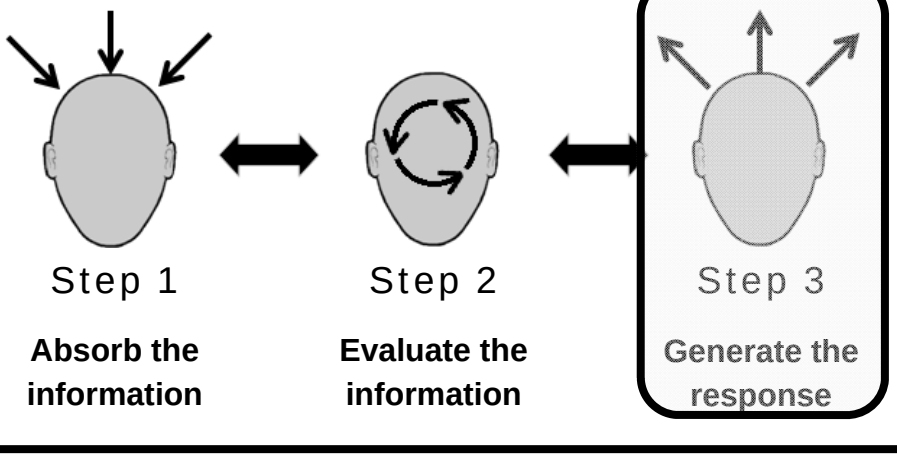
Section 4 - Grading & Analysis

Student Responses
(Extended Response)

The Student Responses are Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

The 1-2-3 of Problem-Based Learning



The SOCIAL STUDIES ANGLE

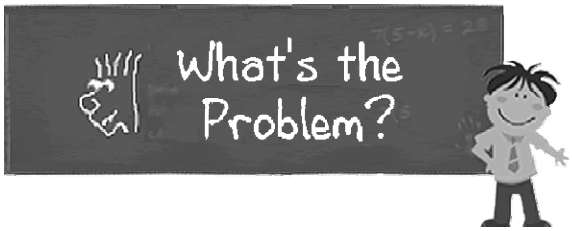
On your Teacher Instruction sheet, you'll see that each scenario provides two types of response options for your students—Extended Responses and the Product Option. Let's look at the **"Extended Responses"** first.

As you would expect, the Extended Responses are simply questions centering around the Problem-Based Scenario that the students answer through their writing.

Most likely, the Extended Responses are similar to what you might see during a Performance Task of a comprehensive assessment (where students are given a range of information to review, and then must give their conclusions based on the evidence). The "test prep" benefits alone make it worthwhile for students to complete the Extended Responses, but the broader benefit is their ability to take the information they've been exposed to and generate a logical response to a problem scenario.

The rubric and process for grading Extended Responses is on the following pages. Also, we will leave it up to you whether you want to allow students to use notes they have taken throughout (we think it's fine for them to do so), and also how strict you want to be with time limits (a half hour or so should be fine).

Here are the Extended Response questions for this scenario.



What do you think?

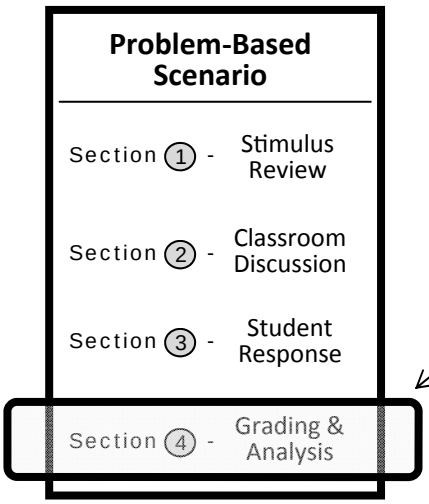
The questions below are centered around the Problem-Based Scenario you've been reviewing. Please answer the questions on separate sheets of paper.

1) **How are people gaining access to "mass media" (i.e. information that reaches lots of people) differently now than in the past? Does this change the influence of mass media on our society?**

2) **Should a publishing company consider changes in mass media when it's making a business decision about magazine format (print vs. online)? What should be the major trends that will determine the company's decision?**

★ *Remember to support your answers with evidence that you've gathered from what you've read and discussed in class!*

Teacher Instruction Sheet



Grading Rubric
(Extended Responses)

The Grading Rubric is Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

The SOCIAL STUDIES ANGLE

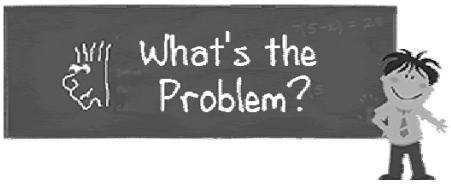
One thing that your students must understand about these Problem-Based Scenarios is that the answer is never "yes" or "no". Instead, students must think their way through the muddy waters of different situations and challenges, while you guide them along the journey.

Of course, the end result needs to be more than a pat on the back—and that's why proper grading is so important. While students may feel that grades exist only to cause stress and fill the blank spaces on a report card, the broader reason is that when students are graded in a clear and fair way, it enables them to continually improve their approach and response.

The Extended Responses for this scenario can be graded using the rubric to the right. It is divided into four sections:

1) Content (*What do you want students to bring to the table based on previous lessons?)*
2) Writing Focus *(Was it clear what point the students were trying to make?)*
3) Use of Evidence *(Did the students back up their position with evidence, quotes, statistics, and facts?)*
4) Language & Conventions (*Did students limit mistakes and respond in a thorough and professional manner?)*

Here is a copy of the rubric for your students to review.



How do I get an A?

Listed below are the four different areas that will be evaluated as your responses are graded. Be sure to consider each area as you write.

Rubric Section #1: Content – you must show a high level of background knowledge and general understanding of the topic

**in other words: *What are you bringing to the table based on previous lessons?*

4	3	2	1	NS
You proved throughout your response to have a high level of background knowledge of the subject.	**You showed a reasonable level of background knowledge through most of your response.**	**You showed a limited level of background knowledge, and only in certain parts of your response.**	**You showed barely any background knowledge of the subject throughout your response.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #2: Production & Distribution of Writing – you must organize and sustain your writing based on a defined purpose

**in other words: *Was it clear what point you were trying to make, and did you focus on that point?*

4	3	2	1	NS
Your response had a defined purpose, and it was organized with a clear focus on that purpose.	**Your response had a defined purpose, although it lacked organization and a clear focus on that purpose.**	**The purpose of your response was a bit vague, and there was limited organization and focus.**	**There was no defined purpose or organization to your response.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #3: Integration of Knowledge and Ideas (use of "evidence") – you must support your arguments and positions with outside information (i.e. "stimulus items")

**in other words: *Did you back up your position with evidence, quotes, statistics, and facts?*

4	3	2	1	NS
You provided convincing support/evidence for your main idea and included appropriate sources, facts, & details.	**You provided adequate support/evidence for your main idea and only limited sources, facts, & details.**	**You provided only modest support/ evidence for your main idea and it was not strengthened by sources, facts, & details.**	**You provided almost no support/evidence for your main idea.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #4: Language & Conventions – you must use proper grammar, spelling, vocabulary, and other conventions of the English language

**in other words: *Did you limit mistakes and respond in a thorough and professional manner?*

4	3	2	1	NS
Your response was professional and you demonstrated a command of language conventions.	**Your response was mostly professional with limited errors related to language conventions.**	**Your response was rather sloppy with multiple errors related to language conventions.**	**Your response was completely sloppy and showed no effort to follow language conventions.**	**Your response was incoherent, off-topic, or unable to be read.**

Teacher Instruction Sheet

Problem-Based Scenario

Section ① - Stimulus Review

Section ② - Classroom Discussion

Section ③ - Student Response

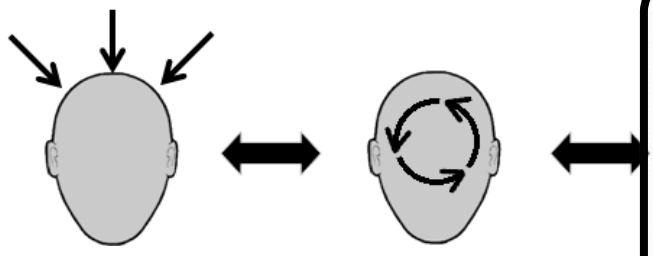
Section ④ - Grading & Analysis

Student Responses
("Product Option")

The Student Responses are Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

The 1-2-3 of Problem-Based Learning



Step 1	Step 2	Step 3
Absorb the information	**Evaluate the information**	Generate the response

The SOCIAL STUDIES ANGLE

It all leads up to this—***"The Product Option."*** It is here that students will have the "thinking muscle" truly stretched and those 21st Century Skills (collaboration, communication, technology, and so on) will be finely tuned.

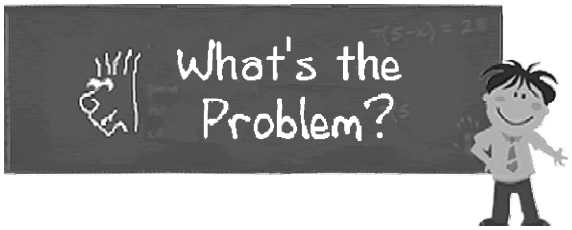
Let's start with a very simple definition:

The Product Option – where students are asked to "produce" something

Yes, this is very broad, and could include any of the following (and so much more):

Bulletin Board	Advertisement	Chart	Role Play	Tips / Suggestions
Letter	Cartoon	Pop-up / Child Book	Commercial	Slogan / Motto
Comic Strip	Play	Collage	Riddles / Jokes	Marketing Plan
Movie Trailer	Poster / Artwork	Timeline	Graphic Organizer	Jingle
Demonstration	Political Cartoon	Prototype	Brochure	Campaign Platform
Diary Entry	Costume	Crossword Puzzle	Poem	Experiment
Editorial Essay	Newspaper Article	Database / Spreadsheet	Rap Song	Mosaic
Map	Diorama	Oral Report	Webpage	Argument
Lesson Plan	Display	Rebus Story	Instruction Manual	Proposal
Fiction story	Mock Interview	Slide Show	Petition	Illustrated Story
Interview	Survey	Recipe / Instructions	Game	Radio show

After you divide your students into teams, photocopy the next page to outline the Product Option for this scenario.

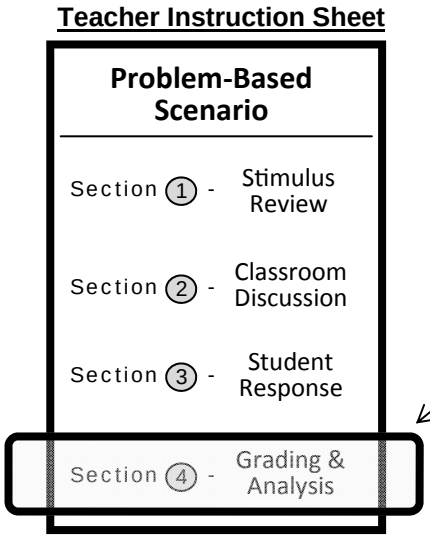


The task at hand...

Working to produce something as a team can help you gain a better understanding of the problem-scenario. Please work together on the exercise below:

Your group is the **Editorial Staff** for a magazine publisher (your group can decide on the exact theme of their magazine). You must consider the news and hot topics of the day, and decide what is worthy of being placed in your magazine. When a topic is chosen, you will **design the layout** for their magazine. This means creating the first page for the article if it is a printed magazine, or the introductory webpage if it is an online magazine.

Consider how a magazine company might customize a trending topic to fit its customer base, and whether this might have an influence on the medium (i.e. print, online, Smartphone app, etc.) that is used to deliver the magazine. How does the format determine the level of customer satisfaction with the magazine and its content?



Grading Rubric
(Product Option)

The Grading Rubric is Section 3 *on your* ***Teacher Instruction Sheet.***

Student Handout

We mention this time and time again through this book, and it's worth saying another time:

It's all about the process.

The purpose of these exercises is to allow students to think through problems and situations, and it's the teacher's role to guide them through the journey.

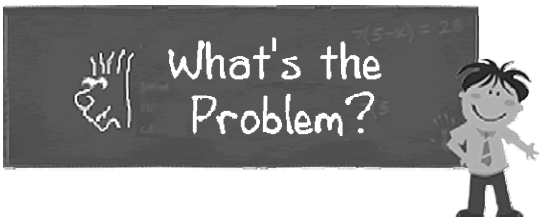
Without a doubt, your students will remind you that "it's all about the process" when they try to convince you to be gentle during the grading process. After all, they've been brought up to bubble in the correct circle with a #2 pencil, so to being asked to "produce" something from a variety of information can be tricky. But they'll do just fine.

As students work through the process, they will learn subject-specific skills and cover a few important standards. Yet they'll also be developing those 21st century skills and lifelong traits that we mention throughout this book (a few are listed below).

- **Critical Thinking**
- **Researching**
- **Creativity**
- **Planning**
- **Communication**
- **Collaboration**
- **Leadership**
- **Technological Ability**
- **Social Awareness**
- **Scientific Literacy**
- **Entrepreneurialism**
- **Self-Direction**
- **Internet / Media Literacy**
- **Data Analysis**
- **Personal Expression**
- **Patience / Perseverance**
- **Listening**
- **Healthy Skepticism**
- **Imagination**
- **Flexibility / Adaptability**

It's difficult to put a hard grade on any of those, and it isn't the final goal. If you live by the mantra, "*It's all about the process,*" these skills will indeed be developed. With that said, you do want to provide worthwhile feedback to your students. We use a simple—but sound—rubric to help students "ace the **TEST**" (a clever acronym to help them remember the key steps). The rubric is provided to the right for your convenience.

Photocopy this scoring sheet for your students to review.



How do I get an A?

As you work in teams on this exercise, you will be evaluated to see if you ace the **TEST:**:

Thoroughness
Evidence
Strategy
Teamwork

Thoroughness

_____ **The group completed all of the required tasks** (15 points)

_____ **Everyone followed directions throughout the process** (15 points)

Evidence

_____ **The group's final product was logical and could be defended** (15 points)

_____ **A variety of evidence was provided to support the product** (10 points)

Strategy

_____ **The group kept its focus on the requirements of the product** (15 points)

_____ **The group used a sound approach in completing the exercise** (10 points)

Teamwork

_____ **Everyone in the group participated and played a key role** (10 points)

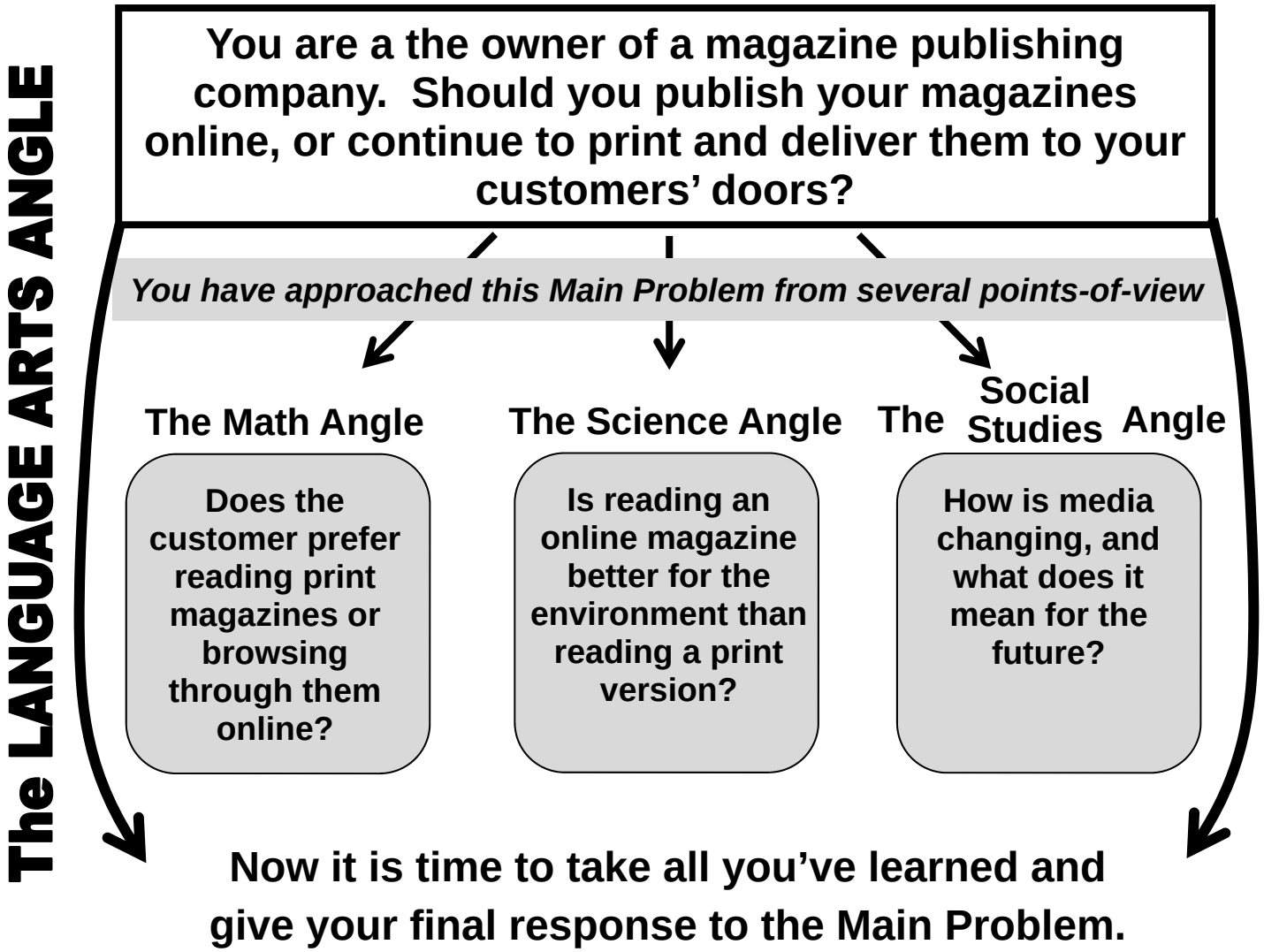
_____ **All members of the group worked well together** (10 points)

Shown above are general areas that your teacher will be evaluating as he or she scores the products you create with your team. You may be provided more details about what it takes to receive the full value in any one of these areas.

Section 5:

"The Language Arts Angle"

The Main Problem:



Now it is time to take all you've learned and give your final response to the Main Problem.

★ *Language Arts serves as the hub for the entire exercise. It is in ELA that all of the other "subject angles" are evaluated and measured against one another, and a final decision about how to approach the Main Problem is made based on all of the available information.*

If you've made it this far into this book, you've probably examined the Main Problem from at least one or two other "subject angles." Everything that your students have been exposed to thus far is fair game in the Language Arts section. That means that they can pull from all **classroom discussion sessions, notes and "Thought-Gathering" Sheets**, and of course the **Stimulus Items** that provide information about the Main Problem.

For your convenience, we've placed all of the Stimulus Items for this Problem-Based Scenario on a special website where **both you and your students** can have full access to them. To access these resources, you will go to:

http://www.pblproject.com/students

Login:
Password:

The "Math Angle"

Stimulus Item #1 — "How do you read?" (survey results)

Stimulus Item #2 — "A Look at the Options" (article w/ statistics)

Stimulus Item #3 — "Print vs. Digital" (infographic)

The "Science Angle"

Stimulus Item #1 — "How do you read?" (survey results)

Stimulus Item #2 — "A Look at the Options" (article w/ statistics)

Stimulus Item #3 — "Print vs. Digital" (infographic)

The "Social Studies Angle"

Stimulus Item #1 — "Print Media vs. the Internet" (pros / cons)

Stimulus Item #2 — "How is Media Changing?" (article)

Stimulus Item #3 — "The Future of Media" (online discussion forum)

Student Responses
Language Arts

In previous sections of this book, students have only concentrated on one piece of the puzzle. Now they will look at the Main Problem as a whole, incorporating everything that has been researched and discussed along the way.

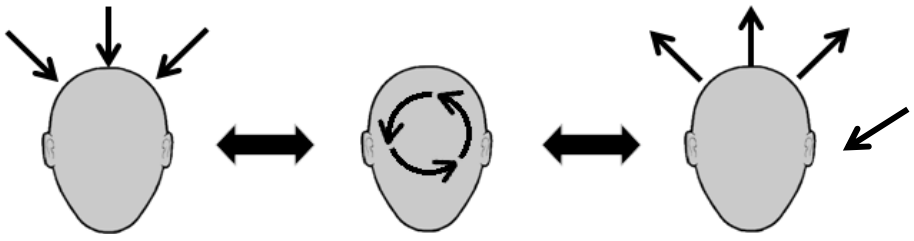
To respond to the Main Problem, a prompt has been provided (shown to the right). Your student's writing—and perhaps oral presentations—will need to meet several expectations from a Language Arts perspective. Students must:

The LANGUAGE ARTS ANGLE

- **Show the ability to comprehend informative texts and resources**
- **Explain their position and overall reasoning**
- **Support their positions with evidence from their research**
- **Articulate clear opinions *(stressed at the elementary level)***
  Form compelling arguments *(stressed at the middle school level)*
- **Demonstrate speaking and listening skills**

The skills above will only be demonstrated if students are able to absorb the Stimulus Items, organize their thoughts, and approach the Problem Scenario in a logical way. If they fail in these tasks before a single word is written on paper, they'll never be able "write their way out of it" at this stage of the game. To put it another way:

The 1-2-3 of Problem-Based Learning



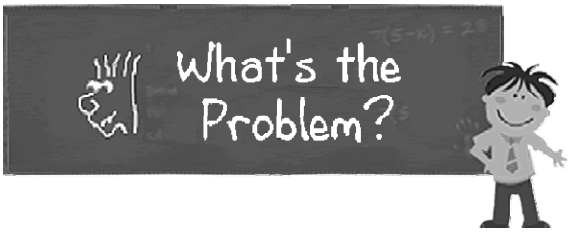
Step 1 — **Absorb the information**

Step 2 — **Evaluate the information**

Step 3 — **Generate the response**

This is not merely a writing exercise! Student responses will never satisfy all of the requirements listed above if Steps 1 and Steps 2 are incomplete.

Here is the Language Arts prompt for this Problem Scenario.



The prompt below is centered around the Problem Scenario you've been reviewing. Please provide your response on a separate sheet of paper.

Decide whether your company will be providing its magazines to your customers online via the Internet, or printed and delivered weekly.

Write an **informative piece** that explains the benefits of your decision. Make sure to include statistics, facts, and any other key evidence gathered from your research of this problem scenario.

You must be prepared to inform your class of your decision and explain your reasoning.

Grading Rubric
(Language Arts)

The LANGUAGE ARTS ANGLE

One thing that your students must understand about these Problem Scenarios is that the answer is never "yes" or "no". Instead, students must think their way through the muddy waters of different problems and situations, while you guide them through the journey.

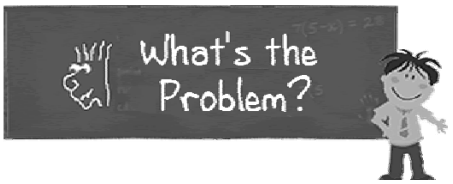
Of course, the end result needs to be more than a pat on the back—and that's why proper grading is so important. Of course, students may feel that grades exist only to cause stress and fill the blank spaces on a report card. Of course, the broader reason is that when students are graded in a clear and fair way, it enables them to continually improve their approach and response.

In many ways, the Language Arts prompt is more difficult than the others because students aren't being asked to stay within the boundaries of math, science, or social studies. Instead, they are given the green light, free to use the research from all other subjects (and anything else they want to bring to the table) to form their response. This may sound easier, but the truth is that the ability to organize information and pull out key evidence (a tricky task for students) becomes more critical and more difficult at this stage. Let's see how they do!

The writing prompt for the Problem Scenario can be graded using the rubric to the right. It is divided into four sections:

1) Logical Approach (*Did students use a reasonable strategy to deal with the Main Problem?)*
2) Writing Focus *(Was it clear what point the students were trying to make?)*
3) Use of Evidence *(Did the students back up their position with evidence, quotes, and facts?)*
4) Language & Conventions (*Did students limit mistakes and respond in a thorough and professional manner?)*

Here is a copy of the rubric for your students to review.



How do I get an A?

Listed below are the four different areas that will be considered as your responses are graded. Be sure to consider each area as you write.

Rubric Section #1: Logical Approach – you must show that a thoughtful and sound process was used to solve the Main Problem.

**in other words: *Did you use a reasonable strategy to deal with the Main Problem?*

4	3	2	1	NS
You proved throughout your response that your approach to the problem was reasonable and consistent	**You showed that your approach to the problem was generally reasonable, although a bit inconsistent**	**You showed there was limited reasoning or consistency in your approach to the problem**	**You showed barely any reasonable or consistent approach to dealing with the problem**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #2: Production & Distribution of Writing– you must organize and sustain your writing based on a defined purpose

**in other words: *Was it clear what point you were trying to make, and did you focus on that point?*

4	3	2	1	NS
Your response had a defined purpose, and it was organized with a clear focus on that purpose.	**Your response had a defined purpose, although it lacked organization and a clear focus on that purpose.**	**The purpose of your response was a bit vague, and there was limited organization and focus.**	**There was no defined purpose or organization to your response.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #3: Integration of Knowledge and Ideas (use of "evidence") – you must support your arguments and positions with outside information (i.e. "stimulus items")

**in other words: *Did you back up your position with evidence, quotes, and facts?*

4	3	2	1	NS
You provided convincing support/evidence for your main idea and included appropriate sources, facts, & details.	**You provided adequate support/evidence for your main idea and only limited sources, facts, & details.**	**You provided only modest support/ evidence for your main idea and it was not strengthened by sources, facts, & details.**	**You provided almost no support/evidence for your main idea.**	**Your response was incoherent, off-topic, or unable to be read.**

Rubric Section #4: Language & Conventions– you must use proper grammar, spelling, vocabulary, and other conventions of the English language

**in other words: *Did you limit mistakes and respond in a thorough and professional manner?*

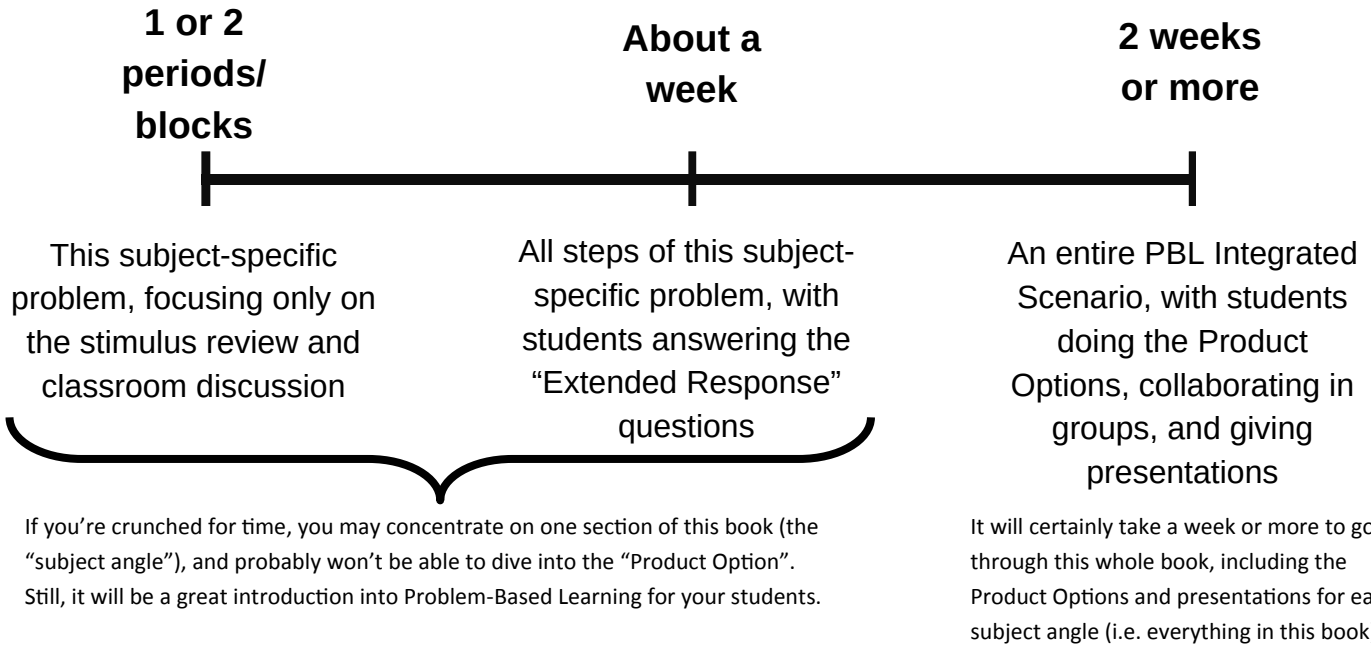
4	3	2	1	NS
Your response was professional and you demonstrated a command of language conventions.	**Your response was mostly professional with limited errors related to language conventions.**	**The response demonstrates an adequate command of conventions.**	**The response demonstrates an adequate command of conventions**	**Your response was incoherent, off-topic, or unable to be read.**

How long will it take?

Without a doubt, the most common question we receive is:

"How long is this going to take?"

Our answer is, ***"It's up to you"*** (which could be seen as dodging the question). The truth is that it's all about options and flexibility. Obviously, the time will greatly vary if you just do a "subject-specific problem" (i.e. one section of this book) or do the entire integrated Problem Scenario (i.e. the whole book).



In the end, if you can take a Problem Scenario all of the way from beginning to end, including each "subject angle", as well as the products, group work, and presentations that go with each one, your students will have accomplished quite a bit. At the end of every section, we have included a "Certificate of Accomplishment" that you may want to give to keep the spirits high and to show students that their efforts are appreciated. Remember, you want them to enjoy the whole experience!

Photocopy this certificate to give to your students.

Certificate
of
ACHIEVEMENT
Awarded to
for completion of the following task:
Given this date
in the year
Signed
Great Job!