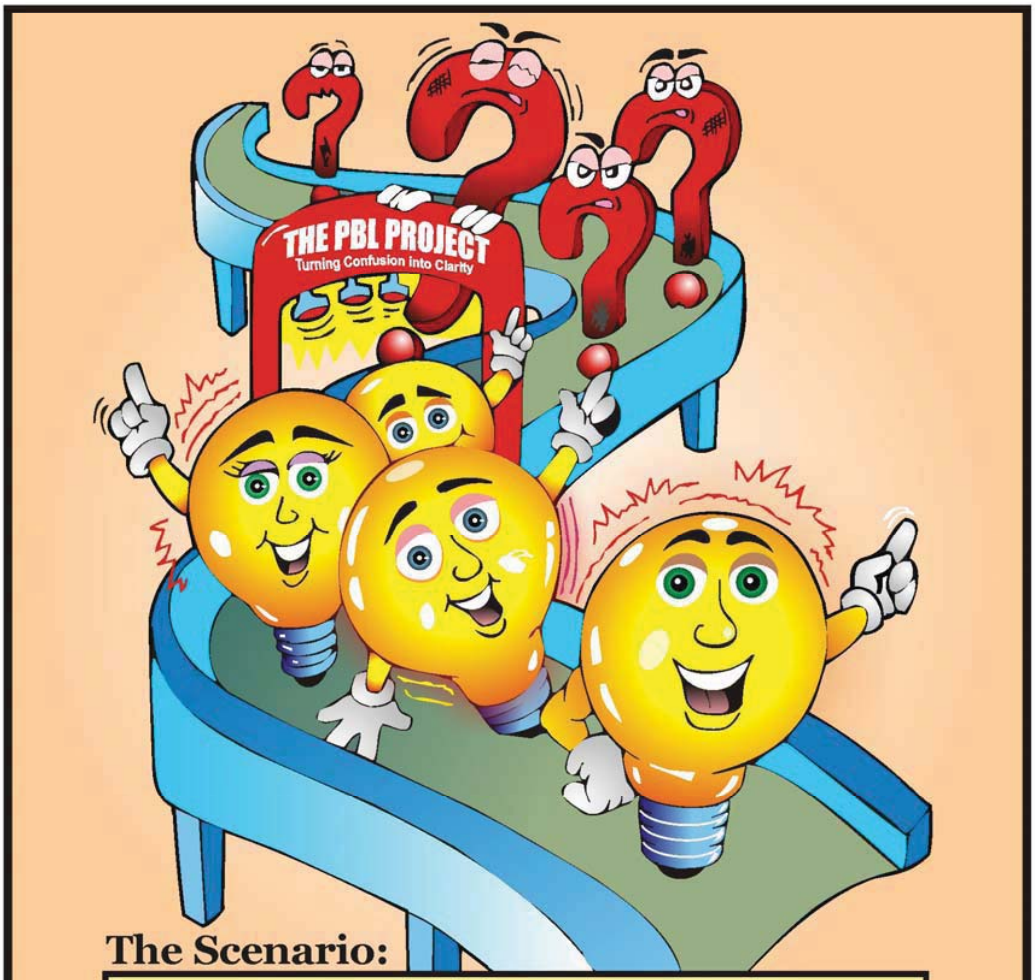
THE PBL PROJECT

Problem-Based Learning. Done Right. Finally.

Integrated Problem Scenarios
Early Elementary



The Scenario:

"The Baseball Field"

You would like to turn an empty lot into a baseball field that can be used by the community. What are the issues involved and is this a good idea?

* Features engaging and real-world scenarios
* Integrates all core subjects
* Includes all teacher and student resources
* Provides a full overview of Problem-Based Learning

Problem-Based Learning. Done Right. Finally.

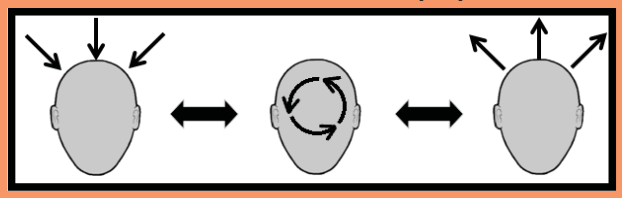
It's an important part of an educator's job to make sure students leave the classroom fully prepared for their lives ahead and equipped with 21st century skills (i.e. skills that focus on communication, organization, technology, and problem-solving). We use these skills every day. Unfortunately, they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

That's why **Problem-Based Learning** is so important. It allows students to tackle a scenario that goes beyond a "yes" or "no" answer. In doing so, students will review a variety of resources related to the topic (articles, videos, statistics, infographics, etc.), engage in classroom discussion, and organize their thoughts as they evaluate the information. After all this, they will have a chance to respond to the challenge and defend their approach.

It won't be easy, but it will be very engaging. Best of all, this process will help develop a wide variety of skills that students will use the rest of their lives!

The 1-2-3 of Problem-Based Learning

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

This book will walk teachers and students through the following Problem Scenario:

The Main Problem Scenario:

You would like to turn an empty lot into a baseball field that can be used by the community. What are the issues involved and is this a good idea?

You will approach this Main Problem from several points-of-view

The Math Angle

How much space is needed for a baseball field?

The Science Angle

What types of resources are needed to build a baseball field?

The Social Studies Angle

How will the public benefit from having a community baseball field?

In the end, you will 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.*

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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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 pre[illegible] the specif[illegible]owle[illegible] as[illegible] sk[illegible]set [illegible]t s[illegible]ents wi[illegible]eed for their future careers may be like a[illegible]d-ti[illegible]r t[illegible]ing[illegible]s [illegible]o[illegible] Ds [illegible]ime [illegible]osule ju[illegible] he can have a good laugh twenty yea[illegible] To [illegible]any [illegible]ve [illegible]m[illegible]he [illegible]in[illegible]onsider a[illegible]ra[illegible]hat 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)*

1970s

Armed with only a calculator and a huge reference book of tax laws, the accountant manually fills out spreadsheets and tax forms, closely checking all the math

1980s

Personal computers and digital spreadsheets arrive on the scene (i.e. early versions of Excel), greatly reducing the amount of time the accountant spends on calculations (while improving accuracy)

1990s

Accounting software (like Quick Books and Turbo Tax) keeps up with the intricate tax laws and also completes the math as you go. Computer skills suddenly become an accountant's most important asset

2000s

Tax software is so user-friendly that people feel they can be their own "accountants". Paid accountants (i.e. the real ones) become guides and "mistake-catchers", and must be experts on the latest computer software

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.

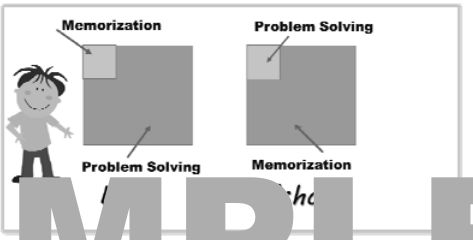
And what about technology?

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 changing. 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.

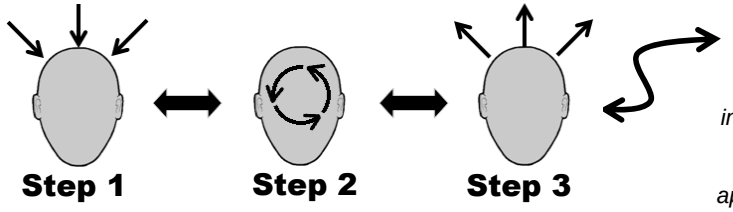
The issue is that the amount of information that is labeled "absolutely must memorize" keeps shrinking and, frankly, gets less critical to a student's success. For example: *Should students instantly know the capital of Alabama?* It's hard to say. After all, it's only a click away.

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 (Step 1) is just a small part of the process. 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')

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 ready for the challenges of life and 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, facts and figures.

For example, let's say we have to go to the bank in the afternoon. In school, we might have a lesson on map reading and ask the students to find the most robust bank. Of course, that's an incomplete look at the challenge of actually going to the bank. Because, getting there on time, the bank is the easy part. To make it a successful outing, you will also need to 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 a baseball fan who owns an empty lot in the middle of town. You want to make that area into a baseball field that can be used by the entire community. What are the issues involved and is this a good idea?

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 or method, and they will present their findings in a simulated "real-life" situation. It will be challenging, but very enjoyable and it will ultimately result in 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*

2 *This scenario is a very **real-world** situation that takes place in communities around the country. Students can see that it can have an impact on their lives, which results in higher engagement.*

> <u>You are a baseball fan</u> who owns an empty lot in the middle of town. <u>You want to make that area into a baseball field</u> that can be used by the entire community. What are the issues involved and is this a good idea?

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.*

Math Standards

Student Handout

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

- **Measurement**
- **Geometry**
- **Numbers & 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.**

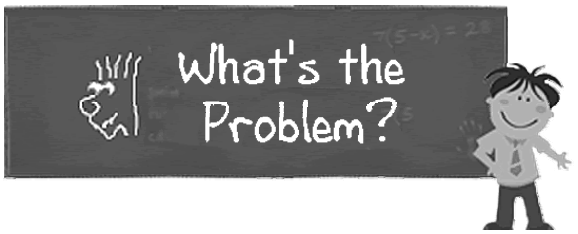
You may want to share the goals listed above with your students prior to beginning the exercise, but the best part is that they'll be developing these skills whether they realize it or not!

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

The MATH ANGLE



Are you ready to tackle the problem?

The Scenario:

You are a baseball fan who owns an empty lot in the middle of town. You want to make that area into a baseball field that can be used by the entire community. What are the issues involved and is this a good idea?

In order to work with a complicated scenario like the one above, you must view it from different points-of-view. In this case, we will look at the following:

Something to think about:

How much space is needed for a baseball field?

Prior to giving an answer, you will review several resources, talk it over as a class, and take time to get your thoughts in order.

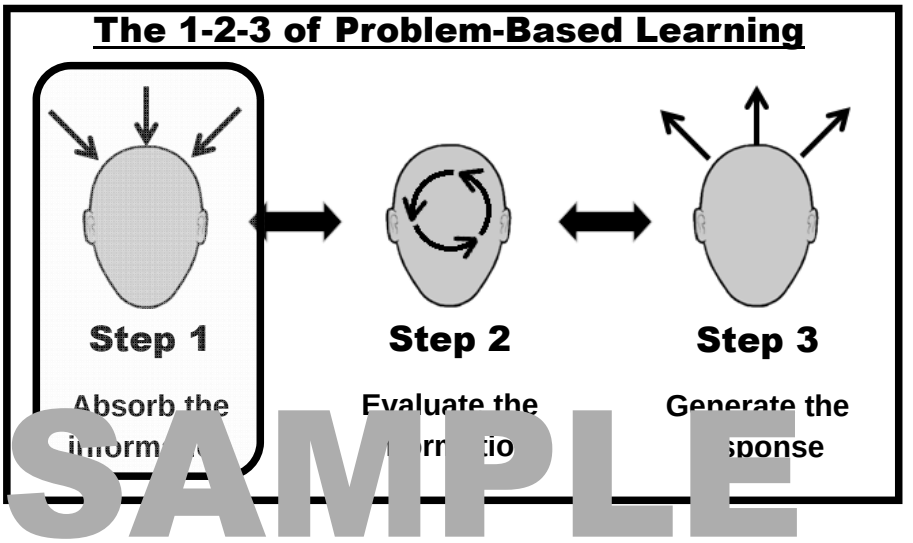
★ *As you work on this exercise, remember that this is primarily a* ***mathematics question****. This means that numbers and computations will be needed to support your ideas!*

Teacher Instruction Sheet

Problem-Based Scenario	
Section 1 -	Stimulus Review
Section 2 -	Classroom Discussion
Section 3 -	Student Response
Section 4 -	Grading & Analysis

Stimulus Review

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



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:

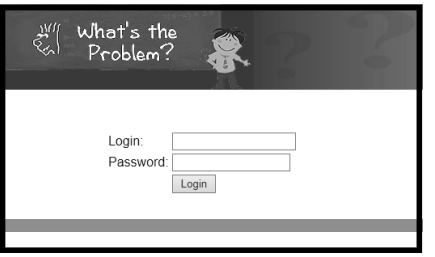
- **Articles**
- **Videos**
- **Infographics**
- **Blogs**
- **Statistics**
- **Lists**
- **Websites**
- **Editorials**
- **Audio Recordings**
- **Cartoons**
- **Primary Sources**
- **Advertisements**

...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: [redacted]



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

Stimulus Item #1

— "The size of a baseball field" (graphic)

Stimulus Item #2

— "Baseball Fi[illegible] Numbe[illegible]" (fast facts)

Stimulus Item #3

— "Community Map" (map)

You may want to replace the map provided with a map of your own community

A Few Notes:

There are a few 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!

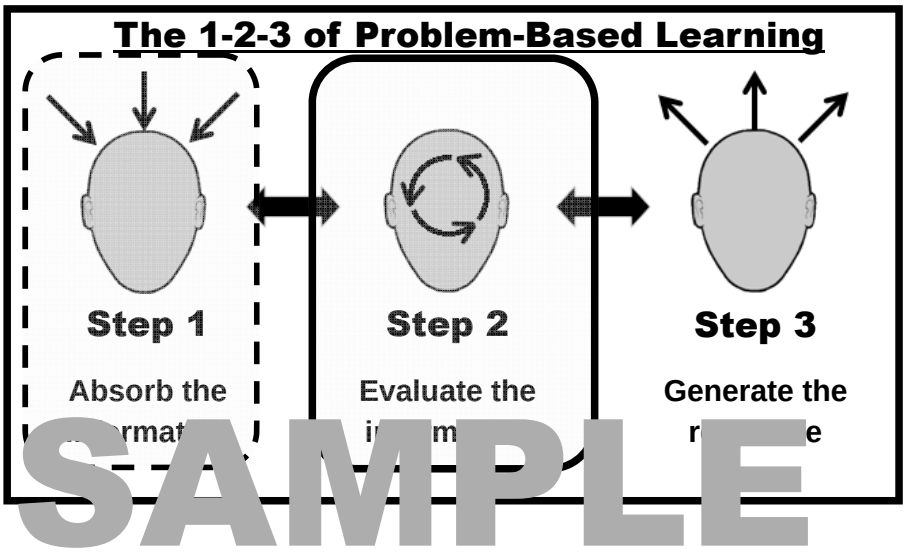
Teacher Instruction Sheet

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.***

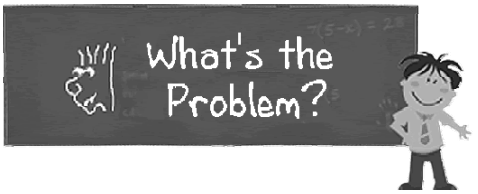
Teacher "Quick Sheet"



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.

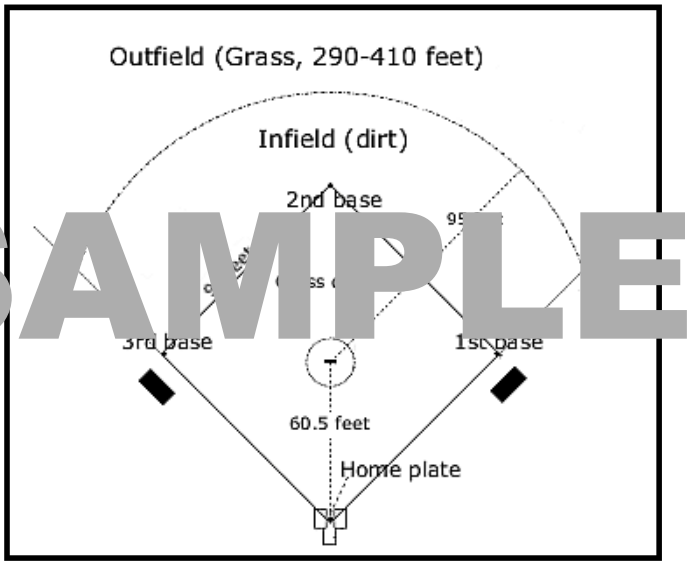


Leading Questions for Classroom Discussion

The Baseball Field (math angle)

How much space is needed to build a baseball field?

- Consider the specific dimensions of a baseball field (although not all fields need to have those exact dimensions), which is seen below
- Consider that it is called a “baseball diamond”, and what that suggests about the shape and measurements
- Consider the amount of space you need beyond the field for things like dugouts, bleachers, concession stands, parking areas, etc.



Where should you place the baseball field on the empty lot?

- Consider the way balls will be hit, and whether there are buildings or windows that would be in the path
- Consider the direction of the sun (you would not want the sun in the eyes of the players)
- Consider other features like parking areas or concession stands to see if they might play a role in where the field will sit

Thinking Exercises

As you wrap up this "subject angle" for the Problem-Based Scenario, it might be worthwhile to go through a few Thinking Exercises with your students. These are extremely effective for early elementary students because they are a simple, engaging way to review content while developing problem-based learning skills. We've provided a variety of different types of exercises that work great with this particular "subject angle":

The MATH ANGLE

Critical Thinking Exercises - these are problems where students must determine what they are truly being asked, and how they are expected to respond

This sample is a **"What would happen if?" Scenario**. This is where students are asked to consider a specific set of circumst[illegible]ther th[illegible]what e[illegible] in[illegible]ty. [illegible] th[illegible]udents [illegible]er the power of "cause-and-e[illegible]" and to [illegible]ow them [illegible] [illegible] a[illegible]y f[illegible] tr[illegible]tional re[illegible]nses.

What would happen if a baseball were twice the size it is now? How about if it were half the size?

Creativity Drills - these are problems that can be approached from a number of different ways, and students must provide multiple responses

This sample is a **"How Many?" Drill**. This is where students are asked to come up with as many situations as possible that fit a set of criteria. This should include the obvious answers, as well as those that require more creative thinking.

How many types of measuring instruments can you name that might be used in building a baseball field?

Missing Information Problems - these are problems where students need to ask questions and seek out more information before they can provide a logical answer. Teachers should provide students with relevant and irrelevant information as they seek out the details.

The Little League Tigers are in the 4th inning of a baseball game. How many more hits do they need to win?

(Remember, you can decide on the details of this scenario and create whatever backstory you'd like. It is up to students to seek out more information from you to uncover the elements of the story and provide a reasonable answer.)

These Thinking Exercises are a great way to put a stamp on this "subject angle" before calling it complete. Obviously, when working with early elementary students on a Problem-Based Scenario, the teacher carries a heavy role as the mediator. After all, this process of absorbing information, evaluating it, and responding in different ways is new to these younger students (and it's a challenging task for students of all ages).

As you know, clever students can often "trick" us into thinking they understand an entire concept simply by recalling facts and figures, or perhaps a tricky definition, at key times. These Thinking Exercises are a good litmus test to see if students really have a deeper understanding of the content. It also gives them the opportunity to take ownership of the information and answer in their own way without trying to match an answer key or adhere to a strict rubric.

Science Standards

Student Handout

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

- **Earth's Materials**
- **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 be:

- **Asking questions and defining 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 "science 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 scientific focus.

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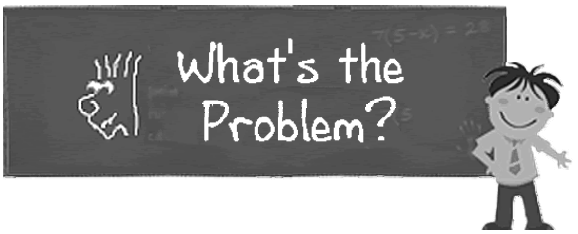

Are you ready to tackle the problem?

The Scenario:

You are a baseball fan who owns an empty lot in the middle of town. You want to make that area into a baseball field that can be used by the entire community. What are the issues involved and is this a good idea?

In order to work with a complicated scenario like the one above, you must view it from different points-of-view. In this case, we will look at the following:

Something to think about:

What types of resources are needed to build a baseball field?

Prior to giving an answer, you will review several resources, talk it over as a class, and take time to get your thoughts in order.

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

Teacher Instruction Sheet

Problem-Based Scenario	
Section 1 -	Stimulus Review
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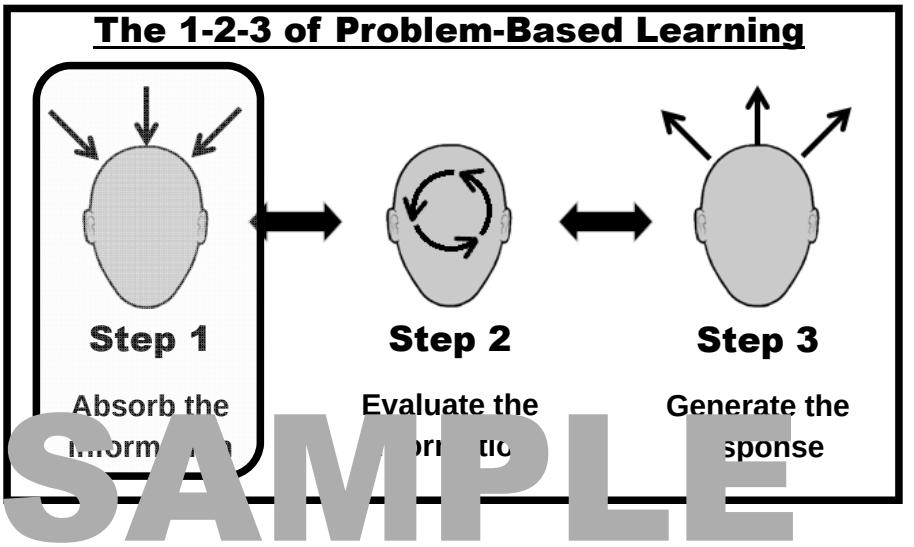
Stimulus Review

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



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

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- **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: [redacted]

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

Stimulus Item #1

— "Baseball Field Materials" (chart)

Stimulus Item #2

— "Baseball Field Dimensions" (article)

Stimulus Item #3

— "Building a Baseball Field" (video)

A Few Notes:

There are a few 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.

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Teacher Instruction Sheet

Problem-Based Scenario

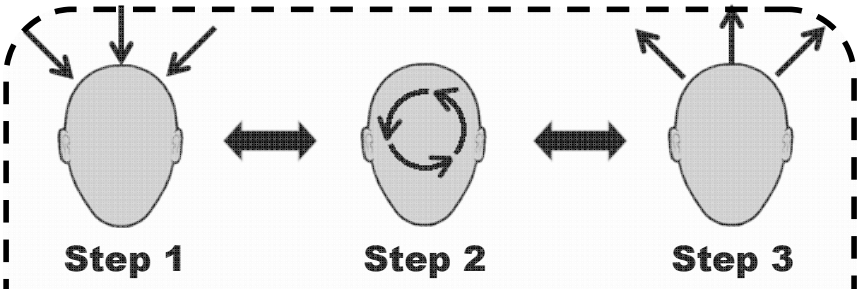
- **Section 1** - Stimulus Review
- **Section 2** - Classroom Discussion
- **Section 3** - Student Response
- **Section 4** - Grading & Analysis

"Thought-Gathering" Sheet

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

Student Handout

The 1-2-3 of Problem-Based Learning



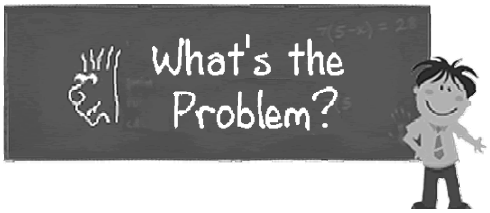
The SCIENCE ANGLE

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.



Baseball Field

“Thought-Gathering” Sheet

Materials Needed to Build a Baseball Field	The Purpose of the Material

Teacher Instruction Sheet

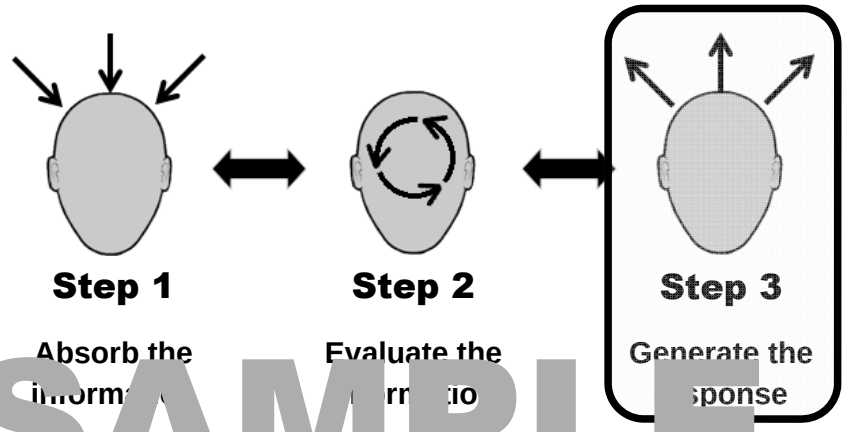
Problem-Based Scenario	
Section 1 -	Stimulus Review
Section 2 -	Classroom Discussion
Section 3 -	Student Response
Section 4 -	Grading & Analysis

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

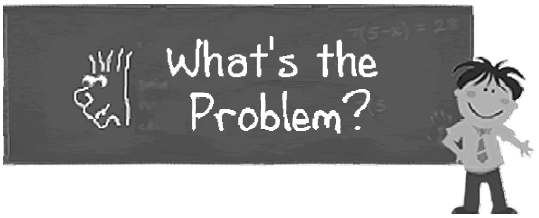
On your Teacher Instruction sheet, you'll see that each scenario provides two types of response options for your students—Extended Responses and the Product Option. Let's look at the **"Extended Responses"** first.

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) How can the quality of a baseball field have an impact on how the game is played? What are main concerns that should be addressed ahead of time?

2) Which materials have the properties that are best suited for a baseball field? Why are they important to the player?

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

Teacher Instruction Sheet

Problem-Based Scenario	
Section 1 -	Stimulus Review
Section 2 -	Classroom Discussion
Section 3 -	Student Response
Section 4 -	Grading & Analysis

Grading Rubric
(Extended Responses)

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

Student Handout

The SCIENCE ANGLE

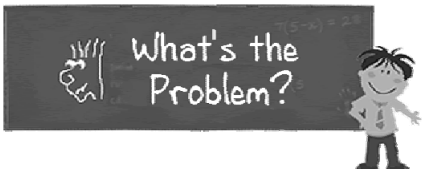
One thing that your students must understand about these Problem-Based Scenarios is that the answer is never "yes" or "no". Instead, students must think their way through the muddy waters of different situations and challenges, while you guide them along the journey.

Of course, [illegible] rest [illegible] eeds [illegible] be [illegible] at [illegible] the b[illegible] and that's why proper grading [illegible] in[illegible]ant. [illegible] de[illegible] f[illegible] that g[illegible] xist only to cause stress and [illegible] la[illegible] spa[illegible] a[illegible] p[illegible] c[illegible], the b[illegible] re[illegible] 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 professional manner?)*

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



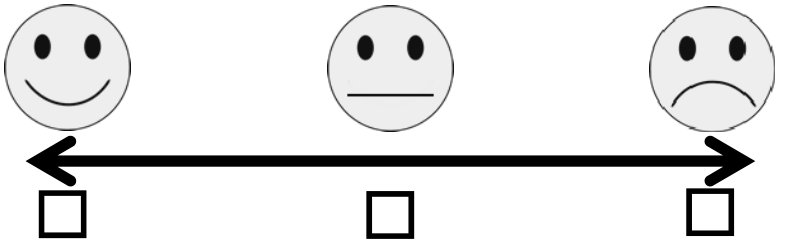
How do I get a great score?

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 have you learned from previous lessons?*

You showed a great understanding of the subject.

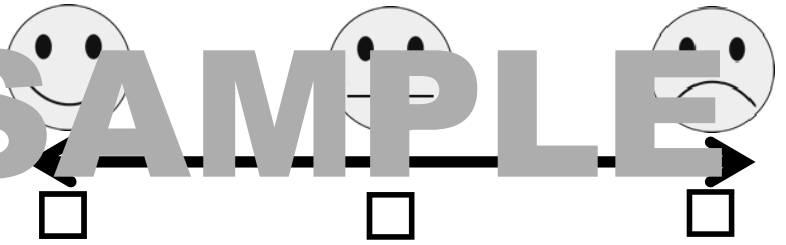


You showed barely any understanding of the subject.

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?*

You had a clear purpose and organized everything aro that purpose

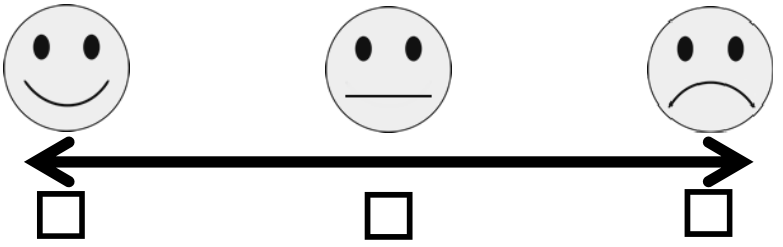


You didn't have a clear purpose and there was little organization.

Rubric Section #3: **Combining Knowledge and Ideas (use of "evidence")** – you must support your arguments and positions with outside information

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

You supported your main idea with evidence and provided key facts and details.

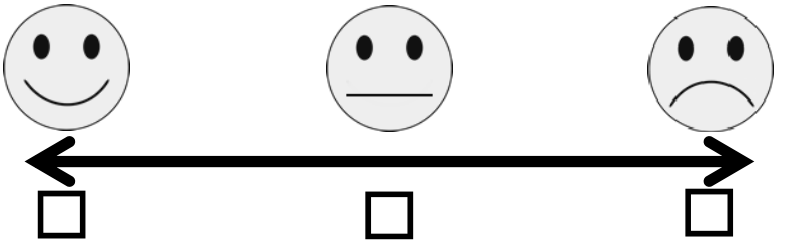


You provided almost no support for your main idea and provided few facts or key details.

Rubric Section #4: **Command of the English Language** – 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?*

You were professional and showed a command of the English language.



You were sloppy and need to do a better job following the rules of the English language.

Social Studies Standards

Student Handout

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

- **Community**
- **Responsibility (lessons learned from team sports)**

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, an[illegible]ronm[illegible]s ***
- **Individual Develo[illegible]t and [illegible]ity**
- **Individuals, Grou[illegible] an[illegible]in[illegible]s**
- **Power, Authority, and Governance**
- **Production, Distribution, and Consumption**
- **[illegible]en[illegible]hn[illegible]gy, an[illegible]y**
- **[illegible]ba[illegible]or[illegible]ct[illegible]s**
- **C[illegible]ic [illegible]eals an[illegible]ractice[illegible]**

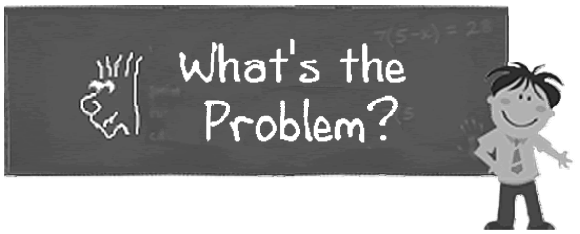
**an asterisk has been placed beside each theme that is a major part of this PBL exercise*

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 "social studies 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 focus on society and historical trends.

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 a baseball fan who owns an empty lot in the middle of town. You want to make that area into a baseball field that can be used by the entire community. What are the issues involved and is this a good idea?

In order to work with a complicated scenario like the one above, you must view it from different points-of-view. In this case, we will look at the following:

Something to think about:

How will the public benefit from having a community baseball field?

Prior to giving an answer, you will review several resources, talk it over as a class, and take time to get your thoughts in order.

★ *As you work on this exercise, remember that this is primarily a* ***social studies question****. This means that you must consider how people live and work together when coming up with your ideas!*

Teacher Instruction Sheet

Problem-Based Scenario	
Section 1 -	Stimulus Review
Section 2 -	Classroom Discussion
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Section 4 -	Grading & Analysis

Stimulus Review

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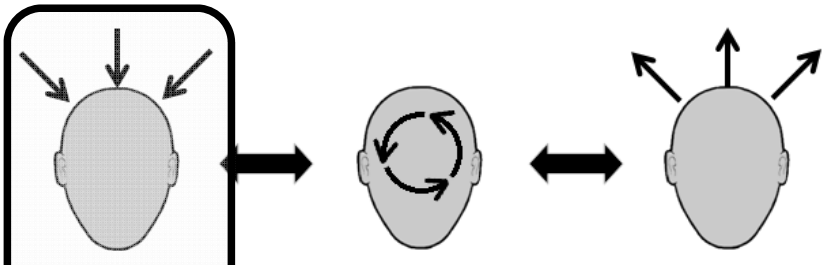
The 1-2-3 of Problem-Based Learning



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

Stimulus Item #1

— "Children & Team Sports" (article)

Stimulus Item #2

— "Community Talk" (video)

Stimulus Item #3

— "Organizing a Community" (infographic)

A Few Notes:

There are a few 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.

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Teacher Instruction Sheet

Problem-Based Scenario	
Section 1 -	Stimulus Review
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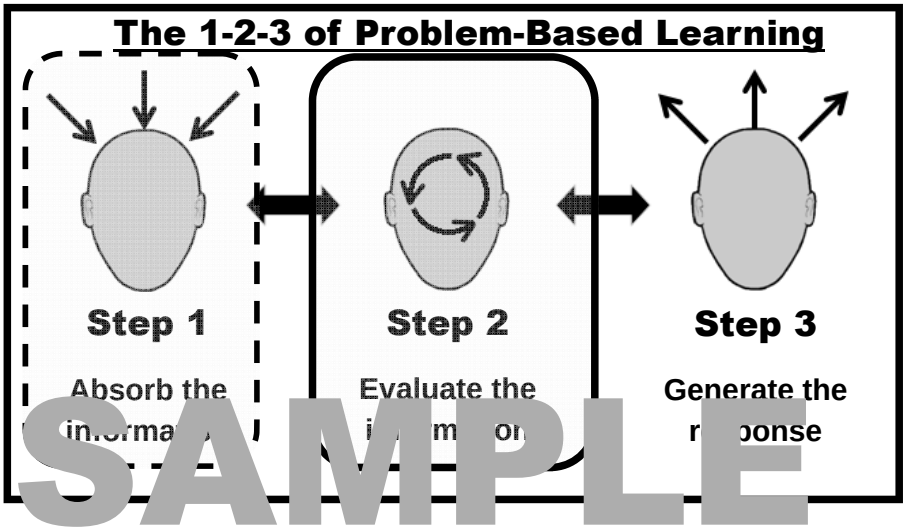
Section 3 -	Student Response
Section 4 -	Grading & Analysis

Classroom Discussion

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

Teacher "Quick Sheet"

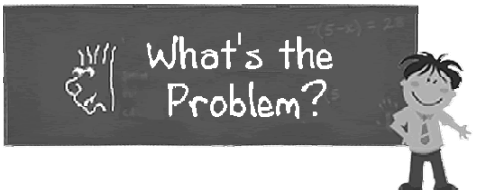


The SOCIAL STUDIES ANGLE

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

The Baseball Field (social studies angle)

Why are parks and common areas important to a community?

- Consider that children need outside, hands-on activities to get exercise, socialize, and have fun
- Consider how taking “ownership” of a park (i.e. keeping it clean and safe and helping with maintenance) offers a way for children to participate in community development, citizenship, and the democratic process
- Consider the ways that a community park provides a sense of place, self-identity, and belonging
- Consider how parks help people get in touch with nature, which is a lifelong habit that has health benefits and enhances well-being

How can a community undertake a project like building a new park on an empty lot?

- Consider how everyone can play a role, whether it’s being a leader or simply volunteering time and effort
- Consider how money may need to be raised through fundraising efforts
- Consider how the struggles of a large project are paid off by a feeling of belonging that spreads through the community, as well as the long term use of the new park by people in the community

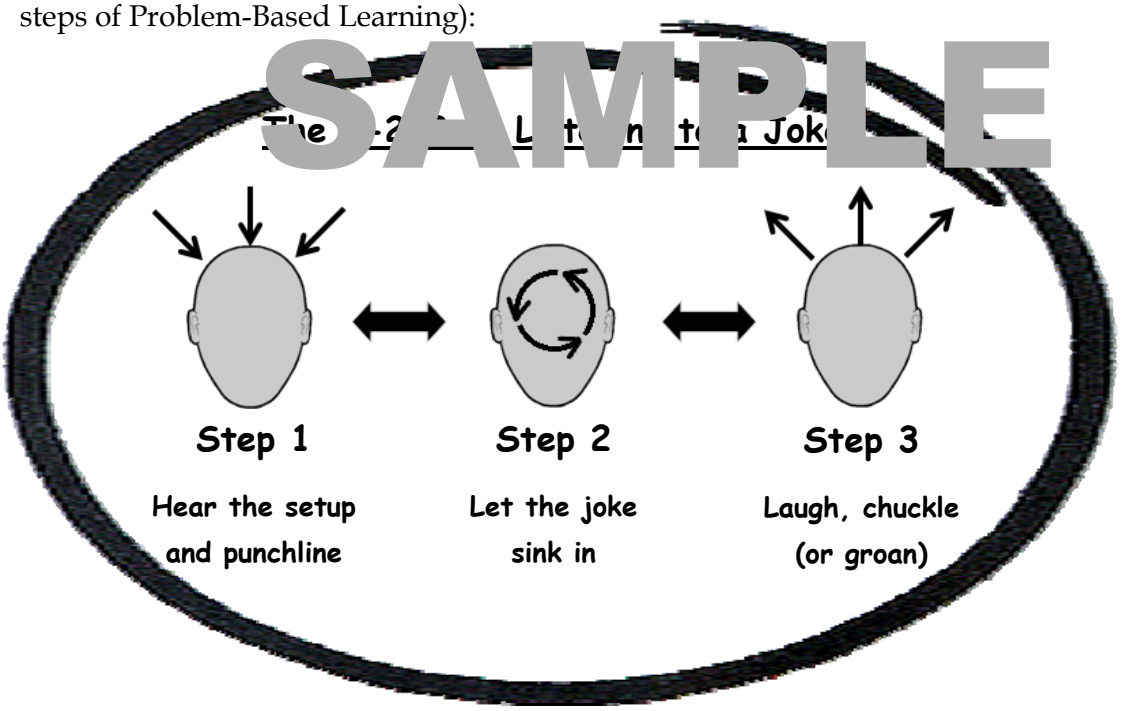
Why are team sports (like baseball) important?

- Consider how sports teach kids important lessons about teamwork, dedication, sportsmanship, and the correct way to win or lose
- Consider how sports are an opportunity for children to be active and exercise, and also provide a chance for parents to be involved with their children
- Consider the social elements of team sports and how it can promote friendships, create a sense of belonging, and can even help children overcome shyness

A Little Humor...

While you may enjoy the material on the next page, please know that we are not adding a humor section simply to offer an escape from the task at hand. Rather, this is another important step in helping students (especially early elementary students) develop the skills of Problem-Based Learning.

Truth be told, these jokes might not be all that funny (we tried our best), but that's not the point. When you tell a joke to younger students, their first reaction is likely a blank stare and furrowed brow. It's at that point that the steps of Problem-Based Learning (absorb the information, evaluate the information, respond to the information) kick into full gear. And it's that "Ah-hah" moment that you're looking for, whether it's a laugh or a groan. That's when you know they've gone through the entire process of listening to a joke (which just so happens to look very similar to the steps of Problem-Based Learning):



The next page features a few jokes that fit with the "subject angle" and might be worth sharing and will help your students casually practice the skills of Problem-Based Learning

"The Baseball Field" - Social Studies

You know you are a true baseball fan if you think the last words to the "Star-Spangled Banner" are *"Play ball!"*

(This one might go over the head of younger students, but the words "play ball" will be music to their ears soon enough)

Jimmy: **I want to hit the ball hard, but I don't want to hit it over the fence.**

Jason: **Why not?**

Jimmy: **Because then the ball will come home!**

(This is a tricky pun, but cleverly getting the ball over the fence results in a "homerun", and you are sent home in a good way. See if your students can make that connection.)

Sister: **"I'm so excited because tomorrow is 'Princess Day' at the baseball park and you get in free if you dress as your favorite princess!"**

Brother: **"That's fine, but you can't go as Cinderella."**

Sister: **"Why not?"**

Brother: **"Because she runs away from the ball!"**

(This one should get instant groans, but it will lighten the mood. You may even have students try to guess the punchline before you deliver it.)

Section 5:

"The Language Arts Angle"

The Main Problem Scenario:

You would like to turn an empty lot into a baseball field that can be used by the community. What are the issues involved and is this a good idea?

You have approached this Main Problem from several points-of-view

The Math Angle

How much space is needed for a baseball field?

The Science Angle

What types of resources are needed to build a baseball field?

The Social Studies Angle

How will the public benefit from having a community baseball field?

The LANGUAGE ARTS ANGLE

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 Scenario is made based on all of the available information.*

Throughout this book, we've been examining the Main Problem Scenario from multiple "subject angles." Well, now it's time to bring it all together. 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 review them. To access these resources, you will go to:

http://www.pblproject.com/students

Login: [redacted]
Password: [redacted]

The "Math Angle"

Stimulus Item #1 — "This is a baseball field" (graphic)

Stimulus Item #2 — "Baseball Field by the Numbers" (fast facts)

Stimulus Item #3 — "Community Map" (map)

You may want to replace the map provided with a map of your own community

The "Science Angle"

Stimulus Item #1 — "Baseball Field Materials" (chart)

Stimulus Item #2 — "Baseball Field Drainage" (article)

Stimulus Item #3 — "Building a Baseball Field" (video)

The "Social Studies Angle"

Stimulus Item #1 — "Children & Team Sports" (article)

Stimulus Item #2 — "Community Park" (video)

Stimulus Item #3 — "Organizing a Community" (infographic)

Teacher Instruction Sheet

Problem-Based Scenario	
Section 1 -	Stimulus Review
Section 2 -	Classroom Discussion
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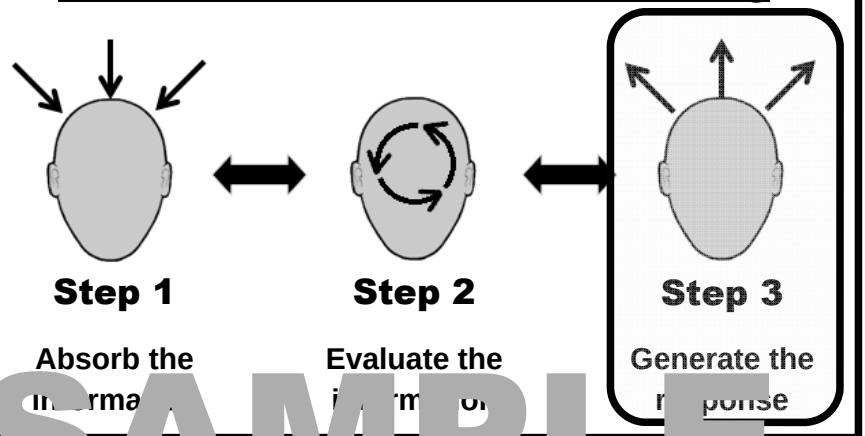
Section 4 -	Grading & Analysis

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



It all leads up [illegible] "[illegible] Product Option" [illegible]s here t[illegible] [illegible] have the "thinking muscle" truly stretched and those 21st Century Skills (collaboration, communication, technology, and so on) will be finely tuned.

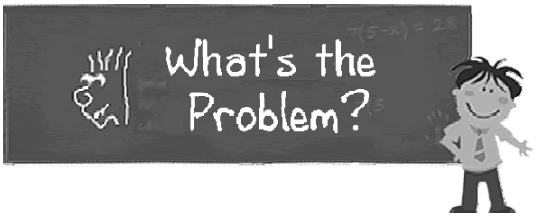
Let's start with a very simple definition:

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 a **neighborhood planning committee**. It is your job to review the layout of a neighborhood, and choose the most fitting place to build a new baseball field.

Your first task is to **create guidelines** for what would make a good place for a baseball field (consider size, access, safety, future growth, etc.).

Next, **construct a model** of the field and everything that surrounds it (parking lot, bleachers, concession stand, playground, etc.). Present this model to the town council (i.e. your fellow students) and see if they are happy with your decisions. You must also explain to the council why building a baseball field will be good for the community!

Teacher Instruction Sheet

Problem-Based Scenario	
Section 1 -	Stimulus Review
Section 2 -	Classroom Discussion
Section 3 -	Student Response
Section 4 -	Grading & Analysis

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.

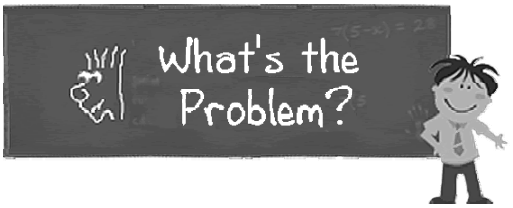
Without a do[illegible] your [illegible]nts [illegible] [illegible] [illegible] "[illegible] all ab[illegible] the process" when they try to co[illegible] [illegible] [illegible] [illegible] [illegible] grading [illegible]rocess. [illegible]fter all, they've been brought up to bubble in the correct circle 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 a great score?

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

Thoroughness
Evidence
Strategy
Teamwork

Thoroughness

_____ **You followed directions and completed all of the steps**

Evidence

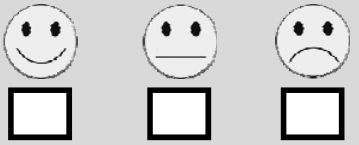
_____ **You used evidence (facts, quotes, key details) to support your position**

Strategy

_____ **You used a sound approach in completing the exercise**

Teamwork

_____ **Everyone in the group participated and worked well together**



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.

How long will it take?

Student Handout

Without a doubt, the most common question we are asked 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). Consider these guidelines:

1 or 2 periods/ blocks	About a week	2 weeks or more
A specific "subject angle", focusing only on the stimulus review and classroom discussion	A step of a single "subject angle", with students answering the "Extended Response" questions	An entire PBL Integrated Scenario with students doing the Product Options, collaborating in groups, and giving presentations
If you're crunched for time, you may concentrate on one section of this book (the "subject angle"), and probably won't be able to dive into the Product Option. Still, this will be a great introduction into Problem-Based Learning for your students.		It will certainly take a week or more to go through this whole book, including the Product Options and presentations for each subject angle (i.e. everything in this 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. For that reason, we have included a **"Certificate of Accomplishment"** that you may want to provide 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:

Problem-Based Scenario — *"The Baseball Field"*

By completing this entire scenario, you have demonstrated that you have the ability to approach a real-world problem, learn about it through a variety of different sources, evaluate all of the information, and provide a clear and logical response to the challenge.

Given this date _____ *in the year* _____

Signed _____

Great Job!