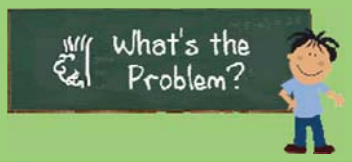
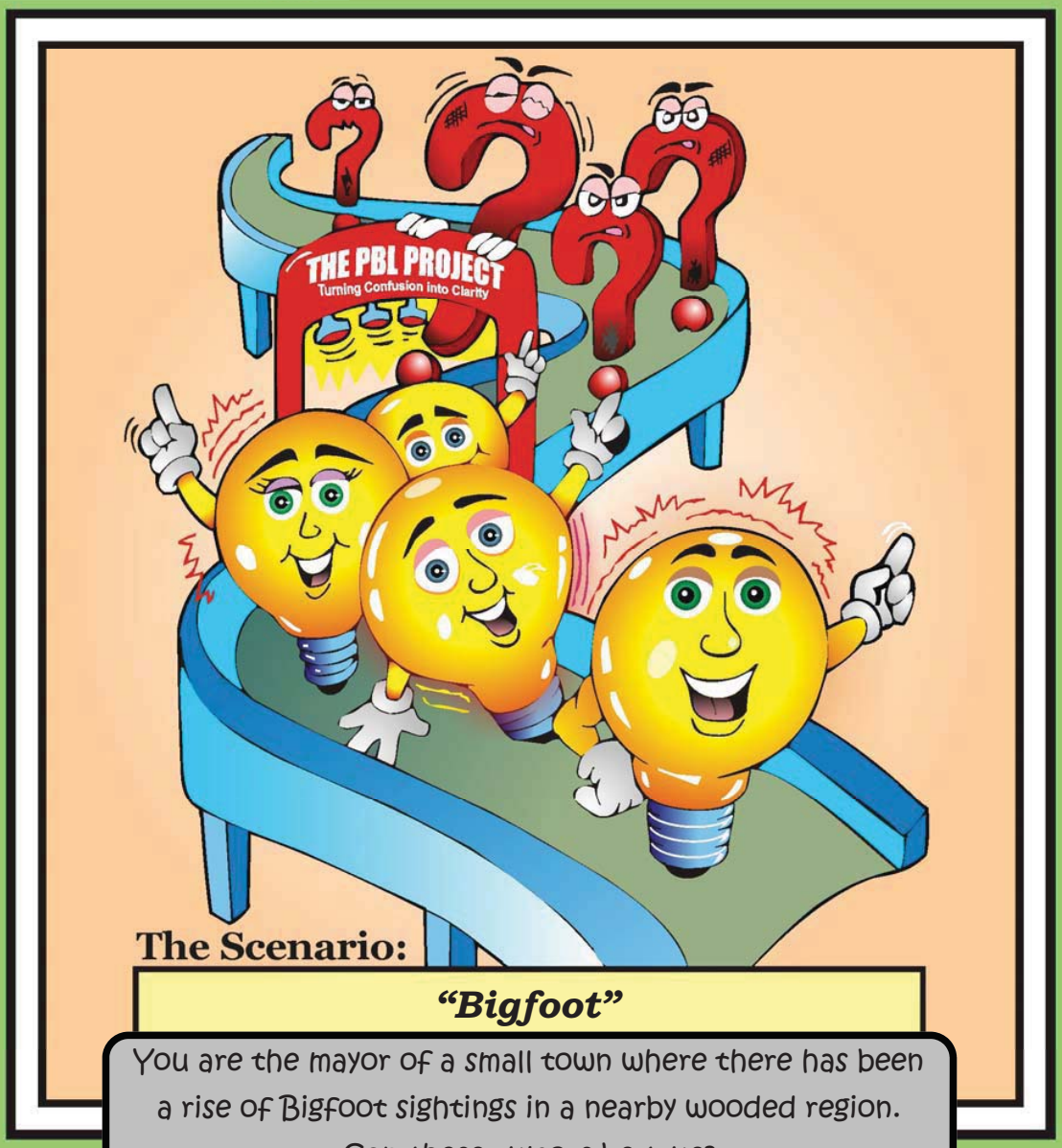
THE PBL PROJECT

Problem-Based Learning. Done Right. Finally.



Integrated Problem Scenarios
Upper Elementary



The Scenario:

"Bigfoot"

You are the mayor of a small town where there has been a rise of Bigfoot sightings in a nearby wooded region. Can these rumors be true?

* 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.

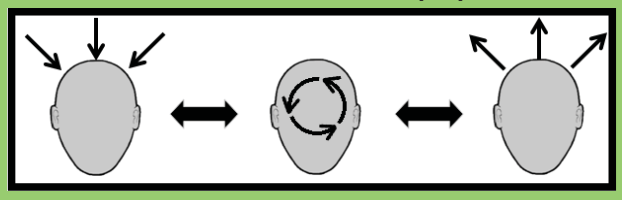
It's an important part of an educator's job to make sure students leave the classroom fully prepared for their lives ahead and equipped with 21st century skills (i.e. skills that focus on communication, organization, technology, and problem-solving). We use these skills every day. Unfortunately, they 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 are the mayor of a small town where there has been a rise of Bigfoot sightings in a nearby wooded region. Can these rumors be true?

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

The Math Angle

Where would be the most likely place for Bigfoot to hide?

The Science Angle

Can the local habitat support a creature like Bigfoot?

The Social Studies Angle

Why is everyone obsessed with the Bigfoot rumors?

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

Table of Contents

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"

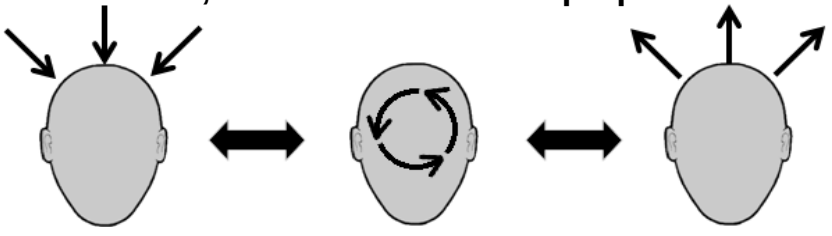
If you're looking for a scholarly academic definition for Problem-Based Learning, this one will do as good as any:

> 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.

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

- **Measurement & Geometry (working with grids)**
- **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 abstra[illegible]nd [illegible]ntit[illegible]ve[illegible]**
- **Construct via[illegible]argur[illegible]s ar[illegible]ri[illegible]e[illegible]e[illegible]as[illegible]ning o[illegible]thers.**

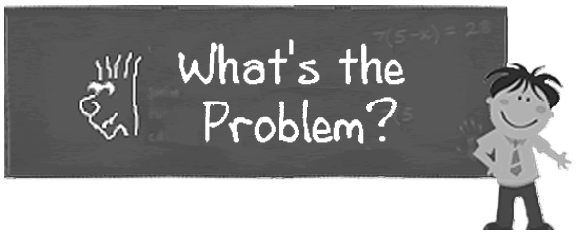
You may want to share the goals listed above with your students prior to beginning the exercise, but the best part is that they'll be developing these skills whether they realize it or not!

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 the mayor of a small town where there has been a rise of Bigfoot sightings in a nearby wooded region. Your town instantly becomes the center of a "Bigfoot Craze" with people coming from all around to spot him. Can the rumors be true, and why are they attracting so much attention?

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:

Where would be the most likely place for Bigfoot to hide?

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 review an area to determine Bigfoot's most likely location based on population distribution, and what the likelihood is that he could "hide" in the area.

★ *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!*

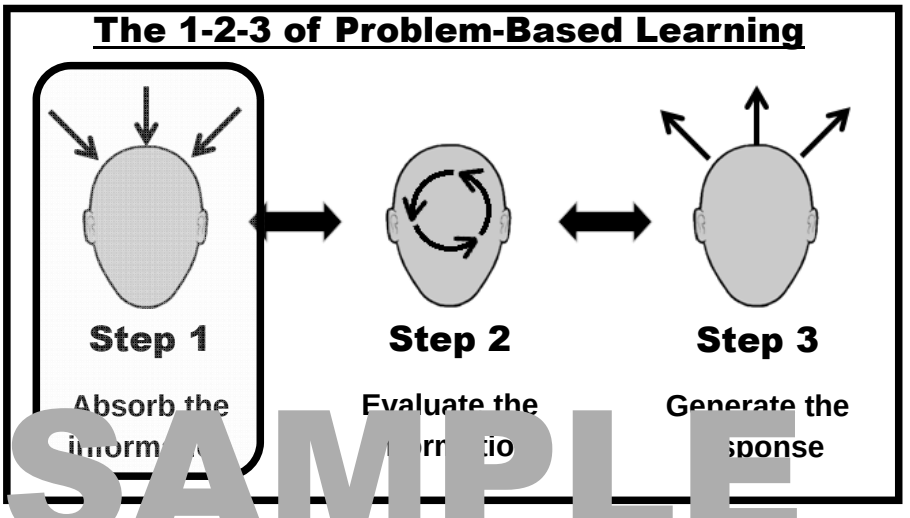
Teacher Instruction Sheet

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.***



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: [redacted]
Password:

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

Stimulus Item #1

— Population Density (map)

Stimulus Item #2

— Arctic Wilderness & Population Distribution (stats)

Stimulus Item #3

— "No More Empty Spaces" (article)

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

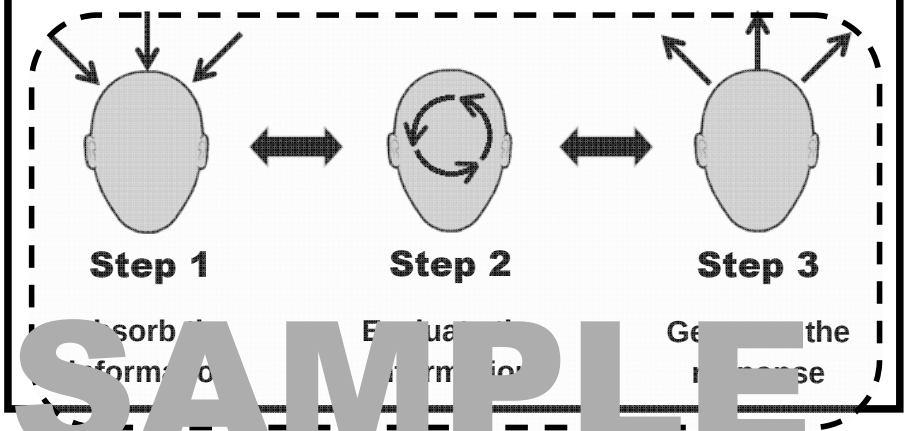
Section 4 - Grading & Analysis

"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 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.

Bigfoot

"Thought-Gathering" Sheet

Based on information from the maps provided, which grids are the <u>most</u> populated.

Based on information from the maps provided, which grids are the <u>least</u> populated.

Although not shown directly, the information in the maps suggest that Bigfoot would obtain what he needs to thrive (protection, food, water, etc.) in which areas:

Teacher Instruction Sheet

Problem-Based Scenario

- **Section 1** - Stimulus Review
- **Section 2** - Classroom Discussion
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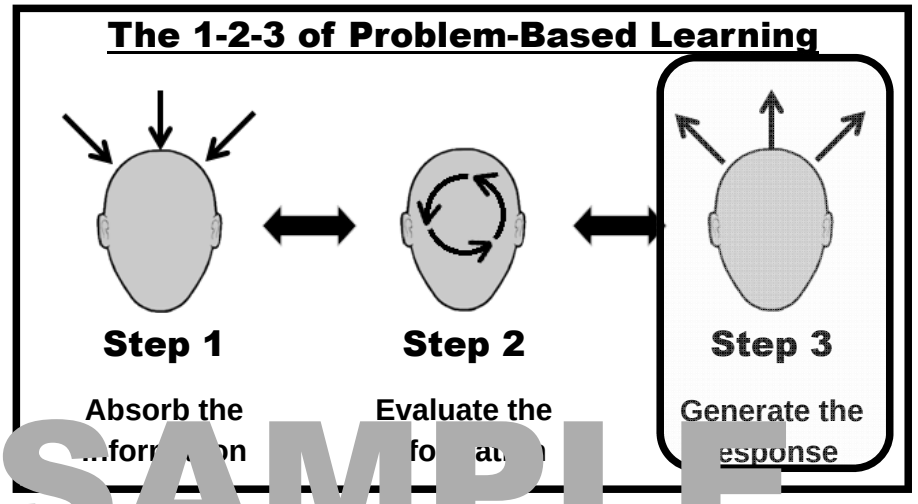
Student Responses
("Product Option")

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

Student Handout

The 1-2-3 of Problem-Based Learning



The 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.

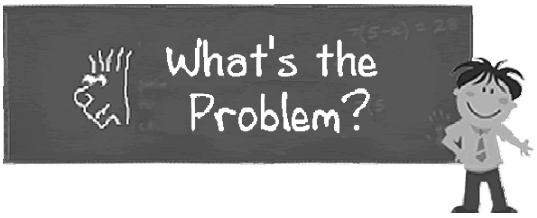
Let's start with a very simple definition:

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...

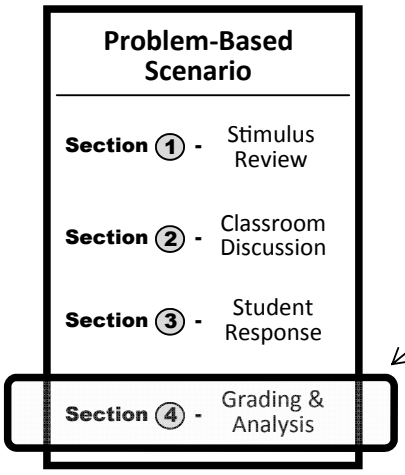
Working to produce something as a team can help you gain a better understanding of the problem-scenario. Please work together on the exercise below:

Your task is to recruit a **"Mathematician"** to help with your **Bigfoot Search Team**.

Your team must think about the duties that this math expert will have. You should consider all parts of the process, such as choosing the correct places to search, reviewing information about previous sightings, bringing the right equipment, and recording the findings. You must consider how math plays a role in all of these steps.

Use this information to **write a letter of interest** for the position of "Mathematician" on the exhibition team. The letter should explain why the position is crucial to a successful search, and it must also include the skills that the job candidate must possess.

Teacher Instruction Sheet



Grading Rubric
(Product Option)

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

Student Handout

The MATH 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.

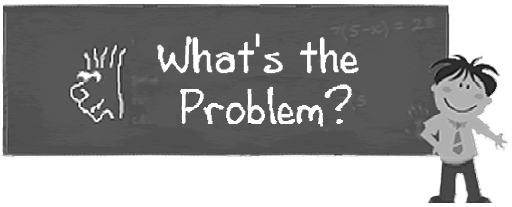
Without a doubt, your students will repeatedly tell you that "it's all about the process" when they try to convince you to forgo the grading process. After all, they've been brought up to bubble in the correct circle with a #2 pencil, so to being asked to "produce" something from a variety of information 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.

The SCIENCE ANGLE

Science Standards

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

Student Handout

- **Ecology, Environments, Habitats**
- **Animals (survival needs and living conditions)**

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 [illegible]nati[illegible] an[illegible]esi[illegible]ng[illegible]io[illegible].**
- **Engaging in a[illegible]ment [illegible] ev[illegible]**
- **Obtaining, ev[illegible]ua[illegible]ng [illegible]o[illegible]m[illegible]ti[illegible] infor[illegible]tion**

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!

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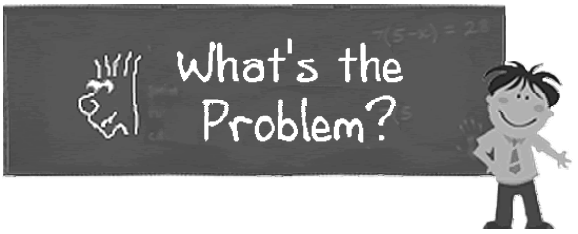

Are you ready to tackle the problem?

The Scenario:

You are the mayor of a small town where there has been a rise of Bigfoot sightings in a nearby wooded region. Your town instantly becomes the center of a "Bigfoot Craze" with people coming from all around to spot him. Can the rumors be true, and why are they attracting so much attention?

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 consider:

Can the local habitat support a creature like Bigfoot?

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 consider the most likely habitat of Bigfoot and what would be needed for the survival of the species.

★ *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, and you'll also want to maintain a healthy skepticism throughout the exercise!*

Teacher Instruction Sheet

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

Stimulus Review

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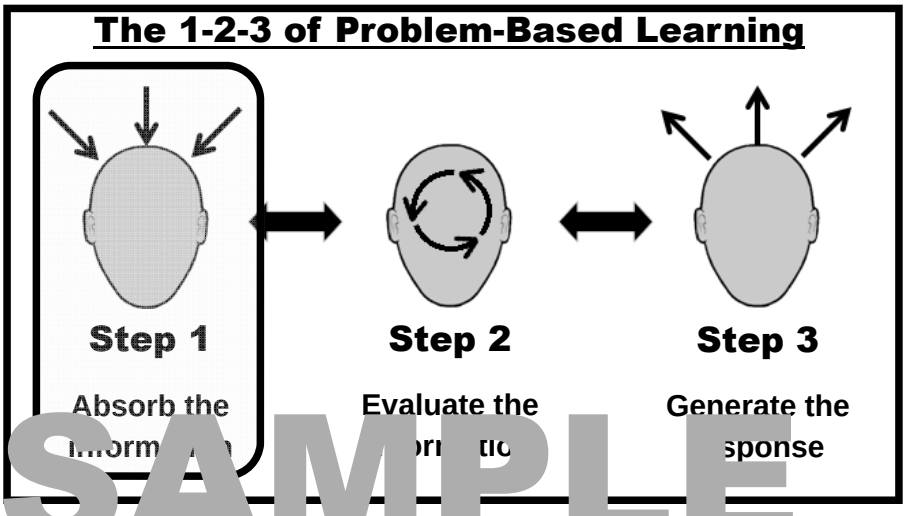

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http://www.pblproject.com/students

Login:
Password: [redacted]

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

Stimulus Item #1

— "A Habitat" (video)

Stimulus Item #2

— "Bigfoot's Animal Habitats" (website)

Stimulus Item #3

— "Bigfoot or Bear?" (news report)

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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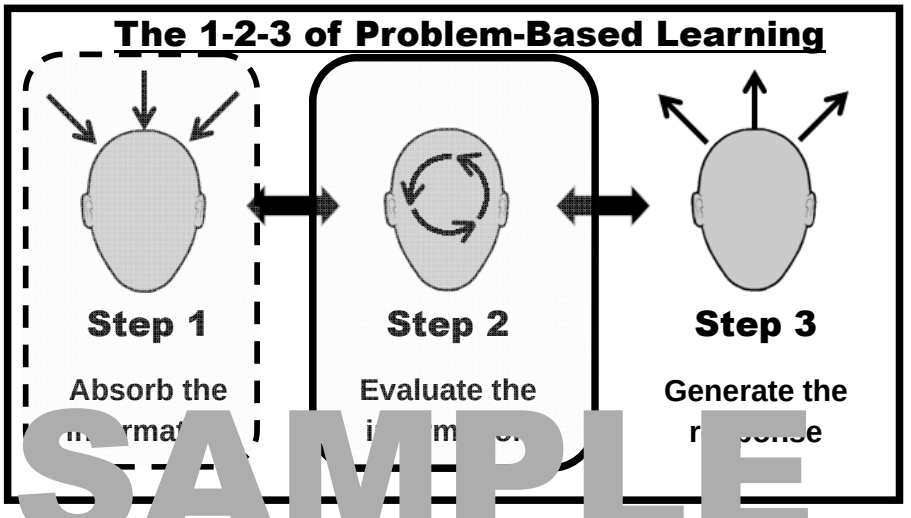
Teacher Instruction Sheet

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

Classroom Discussion

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

Teacher "Quick Sheet"

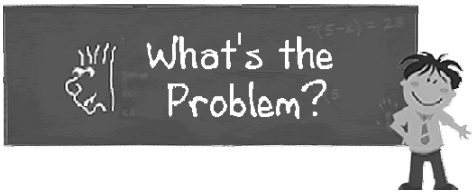


The SCIENCE ANGLE

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

Bigfoot (science angle)

What is the most likely habitat of a creature like Bigfoot?

- Consider where most "sightings" of Bigfoot have occurred, and what habitat traits these areas have in common
- Consider if there are any other animals that can be used as comparisons (bears, monkeys, etc.) based on the predicted size and shape of Bigfoot
- Consider what a Bigfoot-like creature would need for daily survival (food, protection, shelter, etc.)
- Consider what by-products might be used as clues to locate Bigfoot in his natural habitat *("nests", droppings, footprints, etc.)*

Why would studying the habitat of bears (or other large animals) give good information about the habitat of Bigfoot?

- Consider the physical similarities between descriptions of Bigfoot and a bear, and why that would be important in predicting Bigfoot's habitat
- Consider other animals that are similar in many ways (snakes and lizards; alligators and crocodiles; tigers and lions, etc.), and whether there are similarities in their habitats
- Consider why knowing the habitat of an animal is essential to being able to find it

Is it possible that sightings of Bigfoot might actually be other animals?

- Consider where most Bigfoot sightings take place, and what other animals might live there that could be mistaken for Bigfoot
- Consider what sorts of animals would most likely be confused for Bigfoot (bears, monkeys, etc.)
- Consider how Bigfoot sightings are "non-scientific" (they are usually reported by campers, hikers, or hunters), and how that might lead to bad information

Teacher Instruction Sheet

Problem-Based Scenario

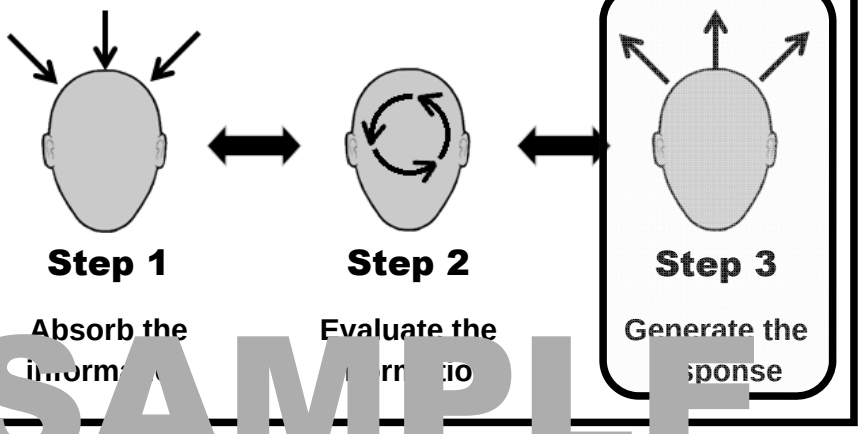
- Section 1 - Stimulus Review
- Section 2 - Classroom Discussion
- Section 3 - Student Response
- Section 4 - Grading & Analysis

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

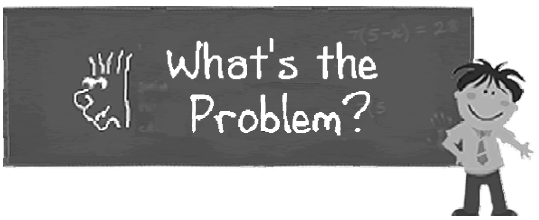
On your Teacher Instruction sheet, you'll see that each scenario provides two types of response options for your students—Extended Responses and the Product Option. Let's look at the **"Extended Responses"** first.

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?

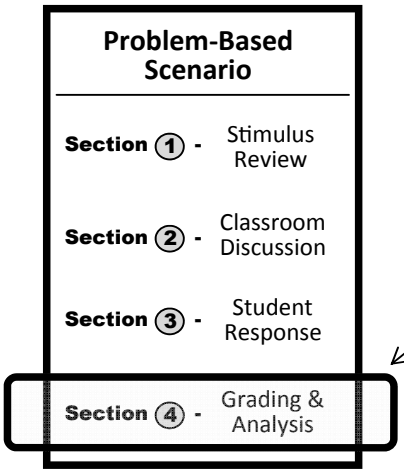
The questions below are centered around the Problem-Based Scenario you've been reviewing. Please answer the questions on separate sheets of paper.

1) **Bigfoot is believed to have a human-like shape, measure about 10-feet tall, and have hair all over his body. How can this information be used to predict Bigfoot's habitat?**

2) **What is the most likely habitat of a Bigfoot creature, and how would knowing this habitat help you if you were trying to find out whether Bigfoot exists?**

★ *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 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] that's why proper grading [illegible] that [illegible] exist only to cause stress and [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.

What's the Problem?

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 purpo[illegible] and was organized [illegible] clear focus on that purpose.	**Your response had a defi[illegible]rpose, alth[illegible]gh[illegible]acke[illegible] or[illegible] and [illegible]cle[illegible] f[illegible] on th[illegible]ur[illegible]se.**	**The purpose of your [illegible]nse[illegible]s a [illegible]a[illegible], a[illegible]ho[illegible]as [illegible]d c[illegible]nization a[illegible] fo[illegible].**	**There was no defined purpose [illegible]rganization to your r[illegible]**	**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.**

Social Studies Standards

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

Student Handout

- **Technology & Society (impact of mass media)**
- **Communities & Cultures**

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

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

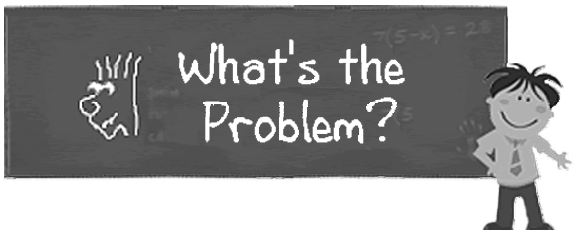
You may want to share the themes listed above with your students prior to beginning the exercise, but the best part is that they'll be developing this broader understanding whether they realize it or not!

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

The SOCIAL STUDIES ANGLE



Are you ready to tackle the problem?

The Scenario:

You are the mayor of a small town where there has been a rise of Bigfoot sightings in a nearby wooded region. Your town instantly becomes the center of a "Bigfoot Craze" with people coming from all around to spot him. Can the rumors be true, and why are they attracting so much attention?

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:

Why is everyone obsessed with the Bigfoot rumors?

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 review urban legends and examine why these rumors exist and continue to thrive even when there is a lack of scientific evidence.

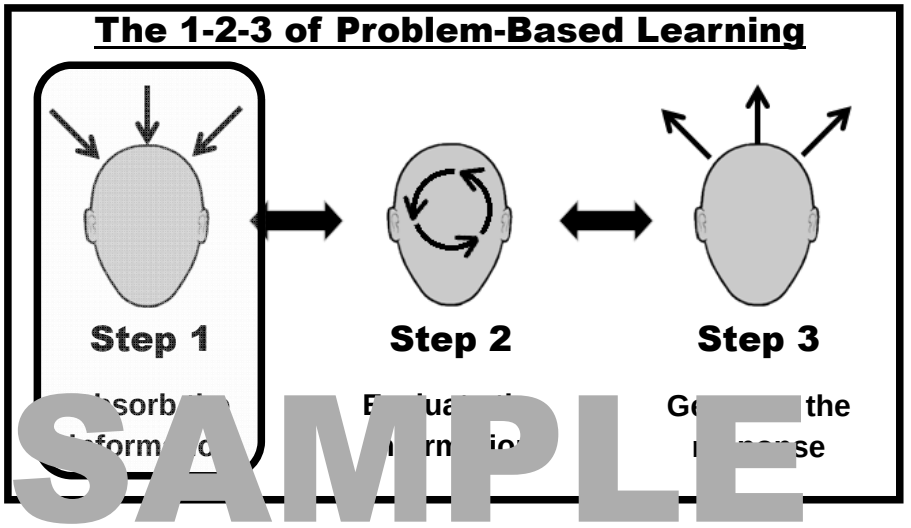
★ *As you work on this exercise, remember that this is primarily a* ***social studies question****. This means that you must consider historical and current trends in our society, along with other political and economic factors, when providing your response.*

Teacher Instruction Sheet

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:

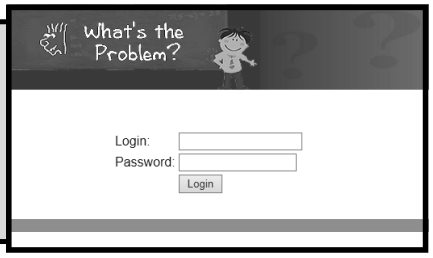
- **Articles**
- **Videos**
- **Infographics**
- **Blogs**
- **Statistics**
- **Lists**
- **Websites**
- **Editorials**
- **Audio Recordings**
- **Cartoons**
- **Primary Sources**
- **Advertisements**

...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

— "Urban Legends by Area" (lists)

Stimulus Item #2

— "The Bigfoot Hoax" (essay)

Stimulus Item #3

— "The Bigfoot Legend" (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.

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

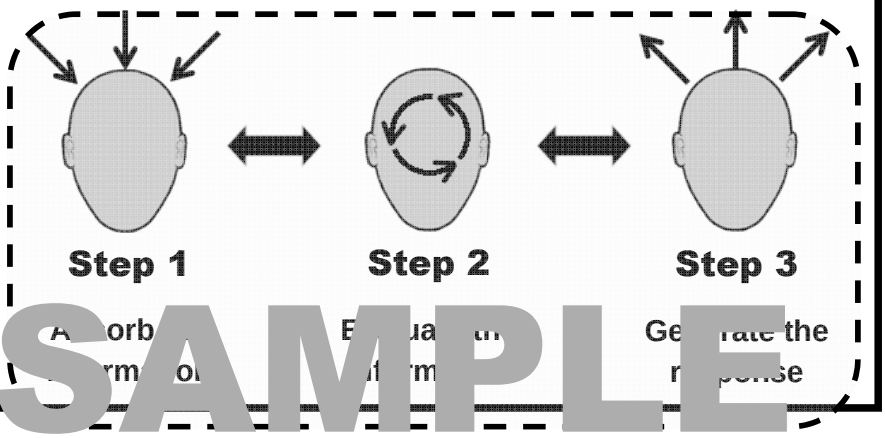
- **Section ①** - Stimulus Review
- **Section ②** - Classroom Discussion
- **Section ③** - Student Response
- **Section ④** - Grading & Analysis

"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



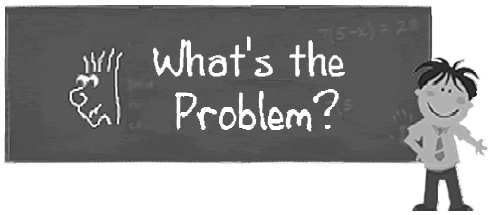
The SOCIAL STUDIES ANGLE

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.



Bigfoot

"Thought-Gathering" Sheet

Fill in this chart to explain our fascination with the unexplainable:

The Unexplained:	Why do these rumors exist?	What does it say about our society?
Myths *(Atlantis, Lost City of Gold, Fountain of Youth, Johnny Appleseed, etc.)*		
Monsters *(Vampires, Werewolves, Bigfoot, Loch Ness Monster, etc.)*		
Ghost Stories		
Other		

Teacher Instruction Sheet

Problem-Based Scenario

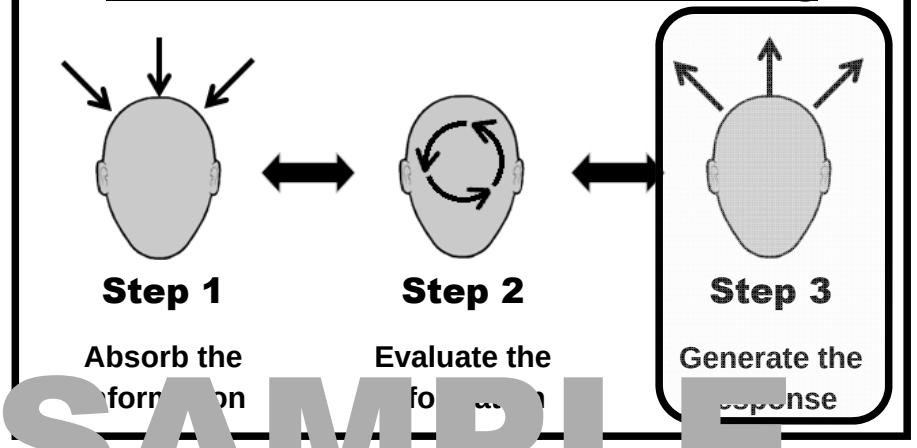
- **Section 1** - Stimulus Review
- **Section 2** - Classroom Discussion
- **Section 3** - Student Response
- **Section 4** - Grading & Analysis

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



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.

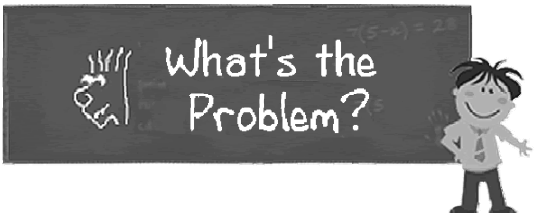
Let's start with a very simple definition:

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 a **team of screenwriters**, and you must **create a script for a movie trailer** for a new feature film about Bigfoot (or another myth or urban legend). The trailer should be 2-minutes long (about 200 words). You should use words and details about the legend that you think will attract an audience and you must be able to explain your choices.

You will present the movie trailer to the class and have others decide if your movie is worth seeing. Consider what you focused on about the urban legend to try to persuade people to come see the movie. What does your advertising strategy say about our society and human nature in general?

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.

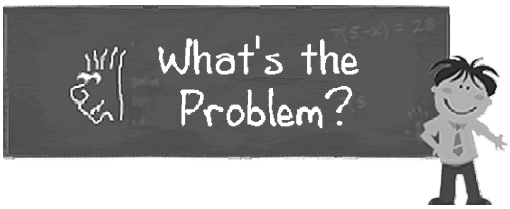
Without a do[illegible]our s[illegible]dents w[illegible]e[illegible]i[illegible]d y[illegible]th[illegible]"[illegible] all ab[illegible]process" when they try to co[illegible]inc[illegible]yo[illegible]ver[illegible]e[illegible]ri[illegible]th[illegible]grading [illegible]rocess[illegible]fter all, they've been brought up to bubble in the correct circle with a #2 pencil, so 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 Scenario:

You are the mayor of a small town where there has been a rise of Bigfoot sightings in a nearby wooded region. Can these rumors be true?

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

The LANGUAGE ARTS ANGLE

The Math Angle

Where would be the most likely place for Bigfoot to hide?

The Science Angle

Can the local habitat support a creature like Bigfoot?

The Social Studies Angle

Why is everyone obsessed with the Bigfoot rumors?

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

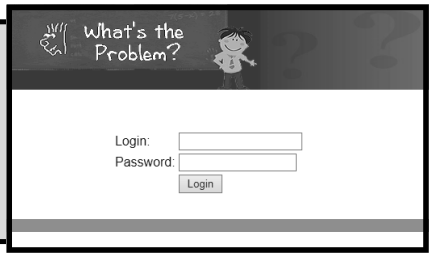
★ *Language Arts serves as the hub for the entire exercise. It is in ELA that all of the other "subject angles" are evaluated and measured against one another, and a final decision about how to approach the Main Problem Scenario is made based on all of the available information.*

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:



The "M[illegible]n Ang[illegible]"

Stimulu[illegible]te[illegible]#[illegible]op[illegible]la[illegible]or De[illegible]sity (m[illegible])

Stimulus Item #2 — America's Wilderness & Pop. Distribution (statistics)

Stimulus Item #3 — "No More Empty Spaces" (article)

The "Science Angle"

Stimulus Item #1 — "A Habitat" (video)

Stimulus Item #2 — "Large Animal Habitats" (website)

Stimulus Item #3 — "Bigfoot or Bear?" (news report)

The "Social Studies Angle"

Stimulus Item #1 — "Urban Legends by Area" (lists)

Stimulus Item #2 — "The Unknown" (essay)

Stimulus Item #3 — "The Bigfoot Legend" (infographic)

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

A specific "subject angle", focusing only on the stimulus review and classroom discussion

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.

About a week

A step-by-step "subject angle", with students answering the "Extended Response" questions

2 weeks or more

An entire Integrated Scenario with students doing the Product Options, collaborating in groups, and giving presentations

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 — *"Bigfoot"*

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!