Imagine you are an engineer working for a telecommunications company. You will create a sales pitch that will convince the Anaheim Planning Commission placing a tower in a particular location is a great idea.

**Task 1**

How cell phones work?
- Model of satellites
- Read articles
- Line graph correlations
- Speed measurement
- Use less data (analyze) of response time
- Population (users)
  * per tower...
  * at what point is a new tower needed

Mini lessons
- Article
- Social justice (guided)

**Task 2**

**GPS Idea: How GPS Works**

**GPS Idea: Understand the Technology Behind a GPS**

**Math Map activity**
- Distance between cell towers
- Pythagorean theorem
- Translation
- Reflect
- Decide place for best coverage

**Task 3**

Argument writing
- Mini lessons
- What is
  - Support a claim (use own research)
- 2-3 min presentations

**Teacher Guide**  
**Unit 2, Task 1**

### Science/Language Arts/Technology Integration  
**Unit Planning Organizer**

<table>
<thead>
<tr>
<th>Resources:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Science Focus</strong></td>
</tr>
</tbody>
</table>

| **Engaging Scenario:** Imagine you are an engineer working for a telecommunications company. You will create a sales pitch that will convince the Anaheim Planning Commission placing a tower in a particular location is a great idea. {Focus is Radius and Pythagorean Theorem not $} |
| **Task Description:** Students will engage in an activity to collect data and find correlations on sending messages to each other in order to gain a general understanding of how cellphones work. Teacher will open unit using T-Mobile Video. Facilitate Teacher led discussion where students share their thoughts on how cellular messaging occurs and how cell towers work. |

### Standards

**Science Standards:**  
*MS-PS4 Waves and their Applications in Technologies for Information Transfer*

**Math Standards:**  
- Verify experimentally the properties of rotations, reflections, and translations:  
  *CCSS.Math.Content.8.G.B.7*
- Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.  
  *CCSS.Math.Content.8.G.B.8*
- Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

### Resources:

**Articles:**
- School Weigh Whether Cellphone Towers are Worth the Extra Cash: Article  (Esperanza High opposes to towers)
- How cell phones work
- Cell Tower Income Secrets To Going Green (article on how to determine if your site favors cell phone tower development)
- American Cancer Society on Cell Phone Towers
- Federal communications commission FACTS background information.

**Videos**
- Video: T-Mobile Commercial
- Video: Verizon: Can you hear me now Commercial?
- Map with Cell Towers in Anaheim
- The Cost of Building and Launching a Satellite
- Text Me worksheet student recording sheet

**Teacher Background:**
**Big Idea:**

**Essential Questions:**
What are the environmental implications of having a cellphone tower near you?

**Assessment:**
End-of-Unit Summative Assessment:

**Background Lesson (hook/relevance):**
Show T-Mobile video without any frontloading.
- Teacher led discussion about the T-Mobile video

**1. Big Idea/Essential Question Focus:**
- Driving Question for task 1:
  - How do cell phones work?
  - How do cell phones send messages to each other via cell towers?

**Lesson:** Students will graph data (time vs. carrier) to make generalizations about how long it takes to receive text messages.
**PURPOSE:** interact with their device and think about it in a different way.
- **Modeling a Structured Process**
- Poll students the day before to determine which companies are represented in the class
- Each group of 3 needs 3 phones: 2 phones for texting, 1 for recording time on the stopwatch (stop watch can be used in place of phone to time)
- The group will record the time the total time text message is sent and received from student A to Student B and back from Student B to Student A.
- Have the words they will text such as “math”
- Investigate the data, students will come up with questions
- Example:
  ATT to ATT, ATT to Verizon, Verizon to Sprint, Etc
The discussion should lead to questions about cell phone towers.

**Show video to summarize how texting works:** What’s the Physics Behind Texting [video]

**Teacher Tip:** Before showing the video, frontload questions to student to guide their focus (i.e. How does a cell phone communicate with a cellphone tower?)

**2. Big Idea/Essential Question Focus:** Social Justice

Teacher note: This article is meant to drive a conversation to build background knowledge on social justice issues. We will revisit this article after completing task 2. The purpose of this article is to build awareness of the pros and cons of the strategic placement of cell phone towers and potential environmental and societal issues.
- **Driving Question #2:** What are the environmental and, socioeconomic implications of adding a third cell phone tower?

**Text & Application of ELA Standard:**
- **Read text:** Esperanza article School Weigh Whether Cellphone Towers are Worth
The Extra Cash: Article

Discussion Question for collaborative conversation:
1. What are the advantages of having a cellphone tower near our school/community?
2. What are the disadvantages of having a cellphone tower near our school/community?
3. Why would people oppose to having a cellphone tower near them?

Teacher Tip: If you have never read an article in class utilize reading strategies (i.e. Close Reading) and speak with the ELA department chair to familiarize yourself with the strategies they are already using within their classrooms.

Possible article to read: Pi Article

Quick write and pair share: Based on what you know and what you read where do you stand in regards to placing a cell tower near schools?
Text me!

Activity: Your partner and you are going to text each other. You are going to measure how long it takes to receive a text message. You will record the time it takes to send a message from Student A to Student B, then from Student B a message sent back to Student A (see diagram). You need someone to be a timekeeper, starting from when the first message is sent from Student A and ending when the second message is received by Student A.

Same Carriers

<table>
<thead>
<tr>
<th>Student A</th>
<th>Student B</th>
<th>Time (seconds) close distance</th>
<th>Time (seconds) far distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell phone Model:</td>
<td>Cell phone Model:</td>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>Phone company:</td>
<td>Phone company:</td>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.</td>
<td>3.</td>
</tr>
</tbody>
</table>
### Mixed Carriers

<table>
<thead>
<tr>
<th></th>
<th>Student A</th>
<th>Student B</th>
<th>Time (seconds) close distance</th>
<th>Time (seconds) far distance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cell phone Model:</strong></td>
<td>__________</td>
<td>__________</td>
<td>1.</td>
<td></td>
</tr>
<tr>
<td><strong>Phone company:</strong></td>
<td>__________</td>
<td>__________</td>
<td>2.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.</td>
<td></td>
</tr>
</tbody>
</table>

**Questions you have about cell phones:**

1. ____________________________________________
2. ____________________________________________
3. ____________________________________________
4. ____________________________________________
Michelle and Steve Adams decided to send their daughter to a school other than Esperanza High when they saw the cellphone tower looming over the football field.

Now, the couple are trying to stop the school district, Placentia-Yorba Linda Unified, from building yet another mobile phone tower. The planned 35-foot tower, designed to look like a eucalyptus tree, would be constructed on the grounds of a nearby middle school.

“It's all about money,” Michelle Adams said of the district's cell tower plans. “They’re using their property as a commercial rental property.”

Placentia-Yorba Linda is just one of many cash-strapped California school districts that are promoting their grounds, often surrounded by homes dependent on cellphones, as the ideal sites for new wireless towers. The state’s public schools have grown increasingly creative in filling budget gaps as tax monies have fallen short of that needed to pay for books, salaries and employee benefits.

But the deals are raising concerns among parents and other residents about the long-term effects of the towers’ radio-frequency waves on children’s health.

The Federal Communications Commission says there is no scientific evidence to conclude that the cell towers cause cancer or other ill effects. But other organizations, including the nation's leading group of pediatricians, have called for more studies, pointing out that children are especially vulnerable to harmful environmental exposures.

Rick Guaderrama, Placentia-Yorba Linda’s director of facilities and maintenance, said that AT&T had asked the district in July if it could place a cell tower at Bernardo Yorba Middle School. He said that even if Yorba Linda’s Planning Commission approves the plan at its meeting on Wednesday night, school officials can still back out of the deal because an agreement has not been signed.

“The district is continuing to evaluate the ATT proposal,” Guaderrama wrote in an email.

Both Guaderrama and Eva Behrend, an AT&T spokeswoman, said that the federal government has developed strict standards for the towers that keep the public safe.

“AT&T has been a part of the Yorba Linda community for decades,” Behrend said, “and we are constantly working to provide our customers with the best possible wireless service.”

She said the company has been working closely with the school district and city officials to design a cell tower site that would “help us close the significant gap in coverage in Yorba Linda and upgrade wireless service for our customers.”

State education officials said they do not track the number of public schools allowing phone companies to build towers on their grounds. But AT&T said it has built similar cell sites at dozens of schools across the state.
Guaderrama added that the district is often approached by wireless companies interested in constructing the towers.

The deals have become so lucrative that companies have formed to help schools negotiate the deals.

In March of last year, Placentia-Yorba Linda hired Wireless Development Partners, a company in Aliso Viejo, to negotiate “multi-carrier cell towers throughout the district,” according to the agreement.

In a letter sent that month, Danny Davenport, the company’s president, proposed that school officials allow him to evaluate the district’s grounds for suitable sites for new towers and then promote the properties to wireless carriers. “The goal would be to maximize the revenue,” Davenport wrote.

Davenport said he would charge the school district $200 an hour and would also collect a fee from the phone companies.

Under the cell tower leases, the phone company pays monthly rent to the schools. For example, Verizon agreed to pay Placentia-Yorba Linda $2,000 a month in 2010 to put up the cell tower at Esperanza High. The district has also agreed to cell towers at two other schools: Yorba Linda High and Bryant Ranch Elementary.

Another company, APWireless, in San Diego, is telling schools that it can “turn their cell site leases into cash,” according to its website. The company is offering immediate lump sum payments to schools for the right to receive the future rental payments required under the leases.

On its website, APWireless explained how it recently negotiated a deal with the Sweetwater Union High School District, which has signed leases for about 30 cell towers, generating as much as $700,000 each year.

Manuel Rubio, a Sweetwater spokesman, said the district had agreed that APWireless could take over the leases for 13 cell towers for 15 years. In return, the district received $3.2 million, he said, which will be used to buy iPads.

Cellphones work by sending radio-frequency waves to nearby towers. The waves are in the microwave frequency, but they are non-ionizing radiation, which means they cannot cause cancer by directly damaging DNA. Stronger types of radiation like X-rays can damage DNA.

The Environmental Protection Agency says that studies have found radio-frequency radiation to be a “potential carcinogen.”

The amount of energy in the waves decreases rapidly with increasing distance from the antenna; exposure at ground level is very low compared with that in front of the antenna. The FCC says that measurements near cell tower sites have shown that ground-level exposure to the radio-frequency waves are well below federal safety limits.

The exposure to the waves from living near a cell tower is usually many times lower than exposure from using a cellphone, according to scientists.

In August, the American Academy of Pediatrics wrote a letter to the FCC, asking for a review of the cellphone safety regulations, which were written in 1996. “It is essential that any new standard for cellphones or other wireless devices be based on protecting the youngest and most vulnerable populations,” the academy wrote.

To protect its students, Los Angeles Unified, the state’s largest school district, banned the construction of cell towers on or near its property almost 15 years ago.

Michelle Adams said the couple found out about the planned tower at Bernardo Yorba not from the school district, but from an email sent by their homeowners association, which detailed information from the city’s Planning Commission.

The couple have gathered signatures from residents opposed to the tower, which they have sent to the commission.

Besides their concerns about the effect of the tower on children’s health, the couple said they believe that values of houses in their neighborhood will decline if it is built. They say there are already cell towers designed as eucalyptus trees in the city, which “clearly look fake.”

“AT&T should not benefit at our expense,” they wrote in a letter to the commission.
Task Description: After reading the articles from Task 1, students will be doing activities to learn more about the Pythagorean theorem and its applications. Then they will be given a map of Anaheim cell towers and will practice finding distance between two objects using the Pythagorean theorem. Then, they will be given another map with a smaller area of the city in order to determine the best location for a third cell phone tower. The third tower should provide the best cell phone reception for the school keeping in mind the effects of cellphone towers just like in the Esperanza HS article from Task 1.

Standards:

Science Standards:
MS-PS4 Waves and their Applications in Technologies for Information Transfer

Math Standards:
CCSS.Math.Content.8.G.B.7
Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
CCSS.Math.Content.8.G.B.8
Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
CCSS.MATH.CONTENT.8.G.A.2
Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

Resources:

- Map with Cell Towers in Anaheim
- What’s the Physics video “What’s the physics behind texting”
- How a cell towers work article: http://technogog.com/information/how-stuff-works-cell-phone-towers/
- Map with fewer cell phone towers near the school to determine the two closest cell phone towers to the school and to determine the location of the third cell phone tower, this worksheet will also use translation of concentric circles to display areas of strong/week/no cell signal.
- Math Worksheet
- Anaheim/Sycamore/South Cell Tower Map labeled with points WS
- (Possible article for task three) http://www.safespaceprotection.com/electrostress-from-cell-towers.aspx Is Cell Tower Radiation Dangerous?

Big Ideas:
• Students will be given the task to determine where to put a third cell phone tower

**Essential Questions:**
What are the environmental implications of having a cellphone tower near you?

**Assessment:**
End-of-Unit Summative Assessment:
Performance assessment: Task 3

**Background Lesson (hook/relevance):**
Article on Esperanza High School

**Sequential Plan for Instruction of Each Big Idea:**

**Intro to Pythagorean theorem activity**

1) Give half the class a ruler and grid paper and the other half a calculator. Give the students with a calculator the task of discovering the Pythagorean theorem by giving them the numbers of a right triangle along with a plus sign and a square root sign and an equal sign on index card and have them discover a true equation (the Pythagorean theorem). Have the students with the ruler and grid paper draw a triangle with the base of 8 and a height of 6 and measure the hypotenuse of the triangle.

2) Then propose a golf course problem where the student know the length and the width and ask the students what is the distance for a hole in one. Some students will make the connection that they can use the Pythagorean theorem.

3) Have students practice saying with number strings side squared side squared equals hypotenuse square. Have students understand a leg is also known as a side.

4) Then have students prove the Pythagorean theorem by making squares on each leg and the hypotenuse.

**Possible homework/extension activities:**

1) Have students in class or at home measure the base and height of a rectangular object to determine the diagonal length of the object (example: screen size of tv, phone, laptop)

2) Have students pretend that there is an object between them such as a building. They cannot measure the direct distance between them. They can construct a triangle and calculate the unknown distance between them using Pythagorean theorem.
1. **Big Idea/Essential Question Focus:**
   - **Essential Question:**
     Determine the two closest cell phone towers to your school using Pythagorean theorem
   - **Vocabulary:**
     - **Pythagorean theorem:** In a right angled triangle the square of the long side is equal to the sum of the squares of the other two sides. It is stated in this formula: \( a^2 + b^2 = c^2 \)
     - **Hypotenuse:** The side opposite the right angle in a right-angled triangle. It is also the longest side of the right-angled triangle
     - **Side length:** When you know any two sides of a right triangle, use the Pythagorean theorem to find the third side.

2. **Big Idea/Essential Question Focus:**
   - **Essential Question:** Where should I put a third cell phone tower so that my school has the best cell phone reception possible?
   - **Use school map with coordinate plane:** Hand out image of cell towers near your school site. To find out where cell towers are located near your school site use this website [city-data.com](http://city-data.com) and look up cell towers.
Use Task 2 worksheet: Handout worksheet. Student will practice how to apply the Pythagorean theorem between two points on the map. Students will be asked to determine where to place third tower.

- **Vocabulary**
  - **Radius:** The distance from the center to the circumference of a circle. It is half of the circle's diameter.
  - **Area:** The size of a surface. The amount of space inside the boundary of a flat (2-dimensional) object such as a triangle or circle.
  - **Distance:** Once the three side measurements are known, then the internal angles 'A', 'B' and 'C' can be found as well.

Students will calculate a cell phone towers range 3 times, for a strong, weak, no signal. Students will calculate this using the formula for the area of a circle and then translate these concentric circles to the other cell phone tower, and use this information to determine the best location for a third cell phone tower.

- **Formative Assessment:**
  Assess whether the student is calculating distance using Pythagorean theorem
Curiouser and Curiouser

Letting them be kids with the Pythagorean Theorem

My slightly modified version of this Teaching Channel lesson on the Pythagorean Theorem started a bit slow but within 10 minutes it gained incredible momentum. By the end of the lesson students were set free to search the hallway for problems and gather anagram clues to solve a Who Done It.

Kids were in partners staring at this image from the SMARTboard file I created for the lesson. The rulers followed the directions on the left. The non-rulers followed the directions on the right.

At first the kids didn’t want to play with the numbers. I wasn’t about to lose at this waiting game so I announced, “Let’s push the pencil and those calculator keys.” One pair began working, then another, then another. Soon the entire class was engaged.

A few minutes went by and one boy asked, “Can the numbers be used more than once?”

“Great question! Yes!”

We had a great discussion on the operations needed to get 10. Not one mention of a formula.

I then asked, “How could we apply what we just learned to golf. How far would I need to hit my tee shot if I wanted to get a hole in one?”
It’s at this point where I tweaked the lesson to my personality. Sidebar: I love the Muppets!

Three of these things belong together.
Three of these things are kind of the same.
Hit it, Kermit!

Sesame Street - Three Of These Thing...
Here is where the knowing the vocab came in handy. After pointing out the legs and hypotenuse, students then realized they would need to do something different to solve Question 3.

They practiced solving these:

round to the nearest whole number

Then it was time to set them free. The students got this handout.
TASK 2 Worksheet

Home Activity 1:

Measure the base and height of a rectangular object in your home. Then using Pythagorean theorem calculate the screen size.

base = __________   height = _______

Name:______________________________________Period:_____Date:_________
Directions: Use Map #1 to determine the distance between cell phone towers in Anaheim using the Pythagorean Theorem.

\[ a^2 + b^2 = c^2 \]

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. AB= _____ units</td>
<td>2. BC= _____ units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. CD= _____ units</td>
<td>4. BD= _____ units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. AC= _____ units</td>
<td>6. AD= _____ units</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Directions: Use Map #2 and the Pythagorean theorem to determine the 2 closest cell towers to your school.

1. AS = _______ units
2. BS = _______ units
3. CS = _______ units
4. DS = _______ units

The closest cell tower to my school is tower_______.

For this purpose assume that:
A strong cell signal has a radius 2 miles around the cell tower.
A weak cell signal has a radius between 2 and 4 miles around the cell tower.
There is no cell signal after a radius of 4 miles around the cell tower.
Trace the area of a strong signal around cell tower A and shade it green
Trace the area of the weak signal around cell tower A and shade it yellow
Outline the area of no signal around cell tower A with red color.

Trace the area of a strong signal around cell tower B and shade it green
Trace the area of the weak signal around cell tower B and shade it yellow
Outline the area of no signal around cell tower B with red color.
Create the circular reception area of a cellphone tower and use transformations to
determine where you would place a third tower.

1. What areas of Anaheim already have great signal? What streets?

Decide where to place a third tower.
2. What are the coordinates of the third tower?
3. What is the distance from this tower C, to tower A and B.
   \[ AC = \text{________} \]
   \[ BC=\text{_______} \]
4. What are the reasons you placed this tower in this location?

5. By placing this tower at this location what other parts of Anaheim now have improved
cell service?
6. Would you rather have a strong signal with a visible tower, or a weaker signal where the tower is farther away?

7. What kind of transformations can you use so that the coverage does not overlap. Reflection serves so that the cell phone coverage area does not overlap.

8. Can you use a rotation transformation.
no it is circular

9. How did you translate your circle?
I translated it ___________(left/right/up/down) this many units.

10. Did the area of coverage change when you translated or reflected the circle?
No it is congruent

The area of coverage can overlap an existing area of coverage when you translate.

Note: I would like to as far as possible to have a strong signal and to minimize dangerous exposure.

After task 3 : an additional question…
Would you leave your cell tower where you decided or would you change the location?
# Teacher Guide

## Unit 2, Task 3

### Science/Language Arts/Technology Integration

#### Unit Planning Organizer

<table>
<thead>
<tr>
<th>Math Focus</th>
<th>Grade Level: 8th</th>
</tr>
</thead>
</table>

**Engaging Scenario:** Imagine you are an engineer working for the school district. You will determine the best location for a third cell tower.

**Task Description:**
In this task, you will learn to give a 2-3 minute, well organized presentation that provides (pitches) enough information using the data generated in Task 2 to convince the school district a location for a cellphone tower based on an economic, environmental, health or socio-economic argument.

**Standards**

**CCSS. Language Arts Standards. Listening and Speaking Standards: SL 8.4** Present claims and findings, emphasize salient points in a focused coherent manner, with relevant evidence, sound valid reasoning and well-chosen details, use appropriate eye contact, adequate volume, and clear pronunciation.

**CCSS.ELA-LITERACY.W.8.9.B**
Apply grade 8 Reading standards to literary nonfiction (e.g., "Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced").

**Science Standards:**

**MS-PS4 Waves and their Applications in Technologies for Information Transfer**

**Math Standards:**

**CCSS.Math.Content.8.G.B.7**
Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

**CCSS.Math.Content.8.G.B.8**
Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

**CCSS.MATH.CONTENT.8.G.A.2**
Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

**Resources:**
- Argumentative Rubric
- Present like Steve Jobs YouTube;

**Essential Questions:**
- What are the environmental and/or socioeconomic implications of adding a third cell phone tower near your school site?

**Assessment:**
- Performance assessment Rubric

**Background Lesson (hook/relevance):**
Revisit the Esperanza Article and discuss the environmental and socioeconomic implications of adding a third cell phone tower.
Sequential Plan for Instruction of Each Big Idea:

1. Big Idea/Essential Question Focus:
- **Essential Question:** What are the economic, environmental, health, or social economic implications of adding a third cell phone tower?
  - **Discussion Question for collaborative conversation:** Investigate the reasons why a school district would consider having cell phone towers on school grounds

- **Text & Application of ELA Standard:**
  - **Articles related to their stance:**
  - **How are they going to comprehend? Comprehension Strategy (Thinking Map):** Use a flow map to organize the sales pitch.
  - **Discussion Question for collaborative conversation:**
  - **Writing product:** Write a sales pitch to convince the planning board to accept their proposition of installing a new tower to increase cell phone coverage within the community.

- **Instructional Strategies & Engaging Learning Experiences:** Create a thinking map to organize your sales pitch.

  **Argument: Hook or State your Position**
  - Introduce the topic with a single headline
  - Keep it clear and consistent during the presentation
  - Give audience a reason to listen
  - Introduce an outline of your 3 main points
  - Wow your audience...be passionate!

  **Evidence/Reason:**
  - Use data from Task 2
  - Make numbers meaningful
  - Make connections

  **Evidence/Reason**

  **Evidence/Reason**

  **Goal**
  - Give a summary sentence that restates evidence and reasons for your position.

- **Formative Assessment:** Present your sales pitch to the Anaheim Union High School District board.

2. Big Idea/Essential Question Focus:
**Presenting argumentative side of where to place cellphone tower in front of an audience**

**Objective:** I can present my findings orally through persuasive speeches, commercials, movies, and other digital projects and/or using visual displays (magazine ad, brochure, poster).
Sales Pitch Mini-Lesson

Process:
1. Select your position on the topic.
2. Plan your organization and delivery technique.
3. Practice your presentation several times.
4. Present to the class.

Your presentation should include:
An attention getting opener and a graceful closing with a take away message.
An enthusiastic delivery. You must make a connection with the audience and hold their attention.
Make connections between your evidence and reasons.
Make numbers meaningful.

Engaging Scenario: Watch the following speech and list your observations. After watching the
video, brainstorm with your group 3 things you shouldn't do when giving a speech and 3 things
you should do when giving a speech.

http://scalemybusiness.com/16-steps-to-an-irresistible-sales-pitch/

Example of what presenter should and should not do

<table>
<thead>
<tr>
<th>Things you should do when giving a speech:</th>
<th>Things you shouldn't do when giving a speech:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Practice</td>
<td>• Reading directly from notes</td>
</tr>
<tr>
<td>• Make eye contact</td>
<td>• Reading directly from screen</td>
</tr>
<tr>
<td>• Can glance at notes</td>
<td>• Turning your back on the audience</td>
</tr>
<tr>
<td>• Speak loudly, clearly, and slowly</td>
<td>• Keeping your hands in pockets</td>
</tr>
<tr>
<td>• Appropriate and professional gestures</td>
<td>• Using fillers like 'um, ah, you know</td>
</tr>
<tr>
<td>• Rhetorical questions to involve the</td>
<td>• Nervous gestures</td>
</tr>
<tr>
<td>audience</td>
<td>• Talking too fast</td>
</tr>
<tr>
<td>• Relax</td>
<td>• Talking too quietly</td>
</tr>
</tbody>
</table>

-Tips for practicing:
● Make sure you are standing, feet planted and shoulders squared! This will help you get
  more comfortable.
● Practice in front of a mirror. Notice your own eye contact and facial expressions.
● Do a few funny versions to relax!
● Ask a friend or family member to listen and give you feedback.
● The more you practice, the easier it will be for you to look up and make eye contact while
  you speak. It will also help you feel more confident and avoid fillers!
● Be aware of holding your paper in front of your face.

Practice:
Using notecards, prepare a 1 minute presentation about the members of your family. You will then
present this information to a partner using the presentation tips.

Assessment: Use argumentative rubric or podcast rubric provided in resource section.