

# Anatomy and Physiology



# Keys to Success



*The reason a lot of people do not recognize opportunity is because it usually goes around wearing overalls looking like hard work.*

*Thomas Edison*

Our class goal is to understand how the human body is organized and regulated, and how behavior and physiology influence each other.

**What you need to do to achieve our aim:**

Trust your teacher; reflect on what motivates and demotivates you; celebrate the peaks and reflect on the valleys in your progress; and make your best effort to do better today than you did yesterday.

**What your teacher will do:**

Listen carefully to what demotivates you and stop doing it. Listen to your hypotheses regarding improving your enthusiasm and learning and test them.

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Calendar



## How to Successfully Study

It does not matter whether you are writing an English literature paper, reviewing algebra problems, or finishing up a chemistry lab report. There are a few key elements every successful student needs to include in a study plan.

- **Time-Management** – It is not the amount of time you spend studying that matters. It's what you can accomplish during that time. Spending 40 hours to prepare for an exam and only earning a C clearly was a waste of your time. Develop a study plan and learn how to manage your time effectively to maximize your results.



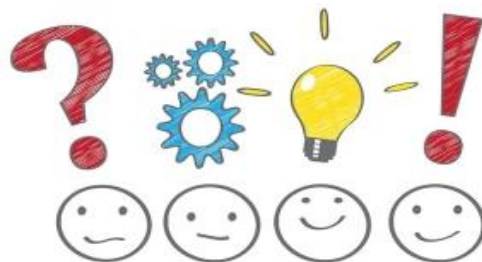
- **Motivation** – If you are not motivated and have a poor attitude, your study session will not be very productive. You have just one opportunity to pass that Geometry exam or ace the term paper. Pick a time of day where you can get motivated to prepare for tests, write essays, and solve problems.



- **Concentration** – The ability to concentrate is one of the more important study skills you need to develop. You won't always be able to study in absolute silence or be able to spend as much time as you would like on a particular project. Learn how to overcome distractions so you can focus all your attention on your studies.



- **When in doubt, ask** – If you aren't sure about a particular topic, don't be shy. Ask your instructor, family, or friends for help. It is important to address the problem area as soon as possible. Otherwise, you will end up having to spend even more time studying to catch up.



## The 5 Academic Keys to Learning

### 1) Repetition

Repetition must come from memory. Reading a bit of information over and over is NOT an effective way to learn.

### 2) Elaboration

Our brains like complexity and they especially like a good story. Information incorporated into a story is much easier to recall. Mnemonics are a simple way to elaborate.

### 3) Spacing (Multiple exposures)

Your brain is designed to forget. You need to reexpose yourself to learned information before you forget it. Each time you successfully recall a bit of information, you can extend the interval between exposures. For example, if you test yourself one day after learning a bit of information and still remember it, you can be certain that you will remember the information for two or more days.

### 4) Making connections between key ideas and the supporting details

Every bit of information should be learned within the context of big ideas. Rote memorization of random facts is an ineffective way to learn.

### 5) Making it interesting

Your brain doesn't pay attention to or remember boring things. You need to find a way to trick yourself into thinking boring information is interesting. Humor is a good tool for this.



## The 3 Physiological Keys to Learning

### 1) No bad stress

Characteristics of good stress: 1) temporary; 2) empowering; 3) results in something predictably good.

Characteristics of bad stress: 1) long term; 2) intense; 3) caused by things we cannot control

Good stress is good for learning and your brain. Bad stress inhibits learning and damages the bits of your brain necessary for learning.

### 2) Adequate sleep

Sleep consolidates memories and is essential for all kinds of learning. Without adequate sleep you will be significantly WORSE at the following: 1) paying attention; 2) remembering; 3) thinking logically; 4) learning math.

### 3) Aerobic exercise everyday

Aerobic exercise increases your heartrate to about 120 to 140 beats per minute for at least 20 continuous minutes.

The following are some of the benefits of aerobic exercise: 1) protects against the negative effects of bad stress; 2) improves quality of sleep; 3) reduces depression; 4) improves reasoning; 5) improves long term memory; 6) helps you solve problems.

## MANDATORY Study Hours Log First Quarter

30 pts weekly

### Weekly Study Hours:

1. Every week you will complete 3 MANDATORY Study Times: 1/2 hour will be completed in Mr. Burke’s classroom, 1 hour will be completed with a classmate from any class period, 1 hour will be completed at home.
2. All 3 MANDATORY times require a supervisor’s initials: Mr. Burke, your Study Buddy (may be different peers weekly), and a parent/guardian.
3. This MANDATORY Study Hours Log is due every Friday by 3:30 p.m. (or earlier)

	Week 1	Week 2	Week 3
Mr. Burke			
Study Buddy			
Home			
			/30
	Week 4	Week 5	Week 6
Mr. Burke			
Study Buddy			
Home			
	/30	/30	/30
	Week 7	Week 8	Week 9
Mr. Burke			
Study Buddy			
Home			
	/30	/30	/30

## Quarterly Reflection:

*20 pts*

1. In **two** complete paragraphs:
  - a. Describe your study routine and habits. Specifically **explain** how you used at least **one of the academic keys to learning** and at least **one of the physiological keys** to learning.
  - b. Explain how you will improve your study routine and habits in the coming weeks.
2. Type the reflection double spaced in size 12 font with your name and period typed into the upper left corner.
3. Take time to proof read your reflection to ensure that it is insightful, purposeful, and clear.

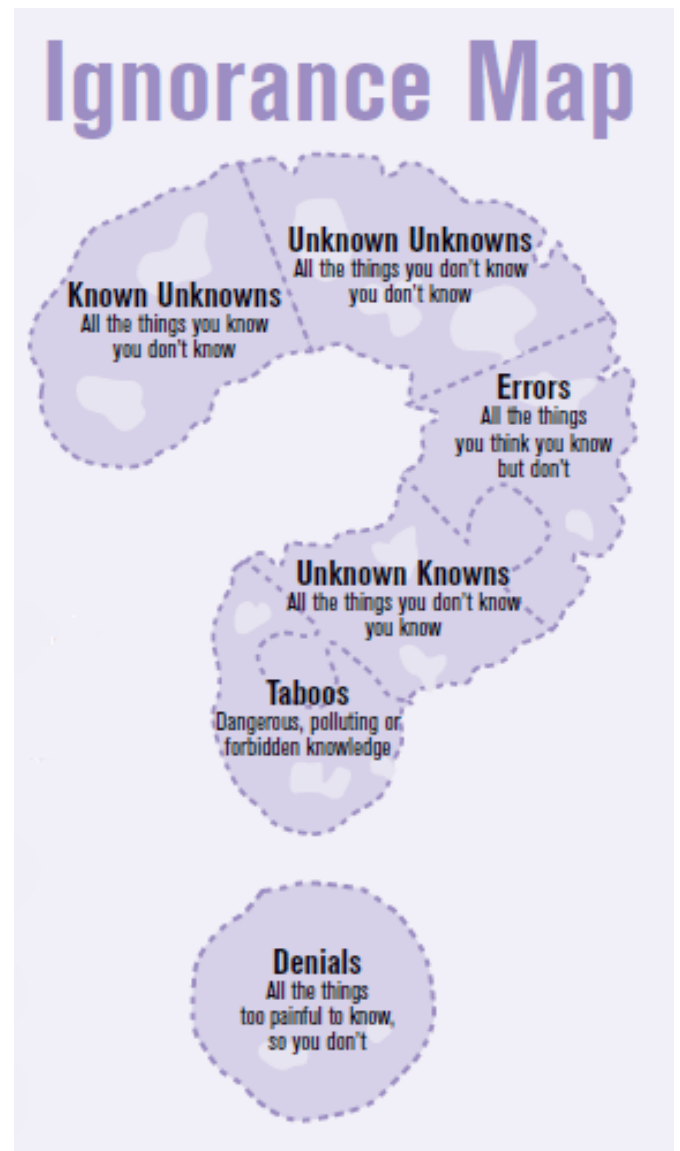
## Question Log: Questioners Questioning Questions

Our imagination is stretched to the utmost, not as in fiction, to imagine things which are not really there, but just to comprehend those things which are there.

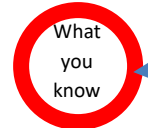
Richard Feynman

### Question Types:

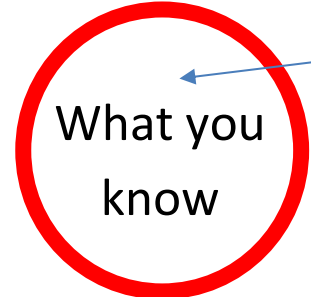
- 1) Basic science knowledge:** these are questions that can be answered by looking up facts in your notes or on Wikipedia (*They should never be on your list*).  
Examples: What part of the brain is most responsible for attention?  
What are the plantar flexor and dorsi flexor muscles that move the foot?
- 2) Application**  
Examples: What would happen if the level of dopamine decreased in the striatum? How does the stride and cadence of a runner affect musculoskeletal health?
- 3) Societal**  
Examples: Is technology use affecting the way people think?  
Why are epidemiologists concerned about decreases in vaccination rates?



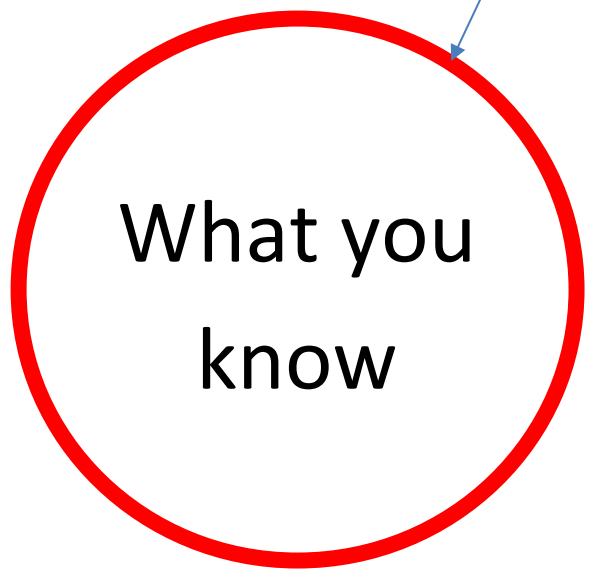
What you know increases as you learn. Somewhat paradoxically, what you know you don't know increases as well!



The size of the perimeter represents what you know you don't know



The area of the circle represents what you know



What you know you don't know keeps getting bigger!

***If you don't have more questions after you engage in a learning activity than when you started, you haven't learned anything.***



## “What I don’t know” and “What science doesn’t know”

Number each question. Answer, and **put a check mark** next to each question with an answer. **Circle** the questions that science doesn’t know.

Questions and answers	Question Type

Number each question. Answer, and **put a check mark** next to each question with an answer. **Circle** the questions that science doesn't know.

Questions and answers	Question Type

## What is WOOP?

WOOP is a method for building self-control

## What should I use WOOP for?

Use WOOP for help with any kind of wish, whether it's something hard ("I want to start a school newspaper") or comparatively small ("I want to get an A in Science this quarter"). WOOP works equally well for academic, athletic, or personal wishes.

WOOP is especially helpful for anyone who procrastinates, who feels anxious about taking the first step—and the next step—toward their wish.

## What makes WOOP effective?

Often, people fixate on how great it would feel to achieve their wish—but overlook the obstacles to that wish. Moreover, it is possible that imagining a wish gives you the illusion of achievement. The positive feelings from imagining success could reduce your motivation to do the hard work needed for real success. WOOP works because it prepares your brain for action and guides you through those in-between and oft-forgotten steps needed to achieve your dreams.

## How do I become an expert WOOPER?

Like any skill, WOOP takes practice and patience to master. It's common to struggle at first. When practicing WOOP, be willing to experiment with different approaches. Make sure you are pursuing a goal that is meaningful to you. Be realistic, and think deeply without interruption when you WOOP.

## WOOP Checklist:

### WISH

- Specific and **important to YOU**
- Can be accomplished in time frame
- Challenging but **feasible**

### OUTCOME

- Fulfilling and **motivating**
- Clearly visualized** (Close your eyes and really imagine it)
- Reduced to most crucial aspects

### OBSTACLE

- Inner obstacle, not outside barrier (it must be **something you have control over**)
- Clearly visualized
- Reduced to most crucial aspects

### PLAN

- Stated as "when ... then..." (What is **the exact thing you will do?**)
- Observable action rather than internal decision (**what does it look like?**)
- You have all resources or skills needed to implement plan
- Plan should be easy to remember

# Wish:

What is an important wish that you want to accomplish? Your wish should be challenging but feasible.

# Outcome:

What will be the best result from accomplishing your wish? How will you feel? How will your wish improve your life? Close your eyes and really imagine it.

# Obstacle:

What is the main obstacle inside of you that might prevent you from accomplishing your wish? Take time to really imagine an obstacle that you have control over.

# Plan:

What's an effective action you could do to tackle the obstacle? Make a when-then plan.

**When...obstacle...then...I will.**

## Cornell Note taking Directions

When taking notes it is important to be studying while you take them rather than after you take them. This will improve the quality of notes you take and reduce your study time over the long run. In the short run, however, you need to be willing to spend more time taking notes than you normally do.

- 1) Before reading each section, write "initial guess" in the cue column and write the answer in the details column. If you are taking notes on a reading from a book or article, turn the section heading or title into a question.
  - this primes your brain for the information that follows
  - guessing wrong has been shown to improve comprehension and recall



- 2) Now read the section and take notes as you see fit.
  - cues such as questions, vocabulary words, and unlabeled diagrams go in the "cue column", which is approximately a third of the page on the left side
  - details such as answers to questions, definitions, and labeled diagrams go in the "details column" to the right of the cue column
    - details begin in line with each cue they explain
    - leave space between the end of details for one cue and details for another cue so you can revise your notes without making them messy
  - we are all visual learners so arrange your notes in a visually rich way
    - you must include all of the provided diagrams in the order they appear in the text
  - You must include at least one higher order question in the cue column that you cannot answer using Wikipedia
    - Highlight the question
    - Leave space in the details section to answer the question
- 3) In the summary section of your notes answer the title question in 3 to 5 sentences.
  - cross out the initial guess you made (do not erase your initial guess)



# Make-up assignments

## 1) Vocabulary Index Card (cannot be used for bones or terms without definitions)

Front side has a cartoon or diagram

1. **Write your name, period, and M#1 on the front of a 4 X 6 note card in the upper right hand corner**
2. The diagram or cartoon must have at least 4 different colors
3. There should be a minimum of writing and explanations on this side of the vocabulary card

Back side explains the word

4. Link-word
  - ✚ A word useful for remembering the word
  - ✚ The meaning of the link-word should be known
  - ✚ Good link-words are related to the vocabulary word or rhyme with it
5. Definition written 3 times from memory
  - ✚ Memorize the definition first
  - ✚ Each time you write the definition, cover up what you have written to ensure you are writing the definition from memory rather than copying the definition over and over
    - a. The definition for a muscle is the origin, insertion, and action of the muscle
6. Write 2 sentences using the vocabulary word correctly

## 2) Riddle Index Card

Front side has the riddle and artwork

1. **Write your name, period, and M#2 on the front of a 3 X 5 note card in the upper right hand corner**
2. Riddle must contain one or more clues
  - ✚ The clues do not have to rhyme, but must refer to aspects of the answer
3. The riddle card must have artwork on the front
  - ✚ The artwork must reflect the topic
  - ✚ The artwork must have a clue that might help solve the riddle
  - ✚ The artwork must have at least 4 different colors


Back side

4. Has the answer to the riddle
  - ✚ The answer must be clearly and cleanly written across the top of the card
5. Below the answer an explanation of how the clues and artwork lead to the answer must be given
  - ✚ Explanation must be at least 2 sentences

### 3) Single Frame Cartoon

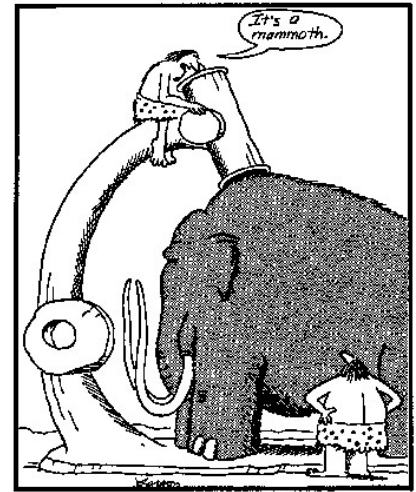
*The cartoon does NOT have to be funny*

Front side

1. Write your name, period, and M#3 on the front of an 8.5 X 11" piece of paper in the upper right hand corner
2. Draw a single frame cartoon like the Farside cartoon to the right  
 Use a minimum of 4 colors
3. Write a caption that is no more than 2 sentences (speaking bubbles are OK but not encouraged)

Back side

1. The concept the cartoon illustrates is stated
2. Write a paragraph that is at least 4 sentences explaining how the cartoon shows the concept stated



Early microscope

### 4) Explain One Term (cannot be used for bones or terms without definitions)

1. Cut an 8.5 X 11" piece of paper in half so you have an 8.5 X 5.5" piece of paper
2. Fold the paper in half so you have a card that is 4.25 X 5.5"

Front of card

3. Write your name, period, and M#4 in the upper right hand corner on the front of the card
4. Write the word and illustrate the word on the front of the card

Inside top half of card




5. Write the type of word it is (noun, verb, adverb, adjective) and how you know
6. Identify and define any morphemes

Inside bottom half of card


7. Define the word
8. Write a sentence using the vocabulary word correctly

Back of card (not shown)

9. Write the definition of the word 5 times

-  Memorize the definition first
-  Each time you write the definition, cover up what you have written to ensure you are writing the definition from memory rather than copying the definition over and over
-  The definition for a muscle is the origin, insertion, and action of the muscle

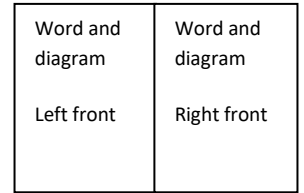
<p><b>Carnivore</b></p> <p>↑      ↓</p> <p>Flesh    Feeding</p> <p>noun because it is a type of thing</p>
<p>An organism that only eats other animals</p> <p>The carnivore refused to eat salad.</p>

<p><b>Carnivore</b></p>  <p>Front of Card</p>
-----------------------------------------------------------------------------------------------------------------------------------



5) **Compare and Contrast Two Terms (counts for 2 vocabulary words and cannot be used for bones or terms without definitions)**

1. Start with an 8.5 X 11" piece of paper in the landscape position
2. Fold the paper by bringing the two ends to the center of the paper
3. The result should be a 5.5 X 8.5" paper with two flaps that are like shutters covering a window

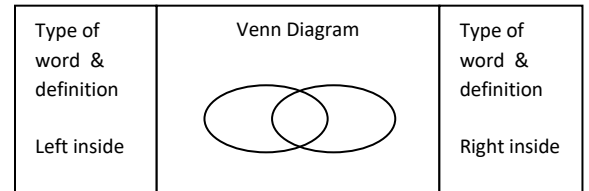


Left side

4. One term and an illustration on the front
5. The type of word (noun, verb, adjective, or adverb) and how you know on the inside left flap

Right side

6. **Write your name, period, and M#5 on the front in the upper right hand corner**
7. One term and an illustration on the front
8. The type of word (noun, verb, adjective, or adverb) and how you know on the inside left flap



Inside center

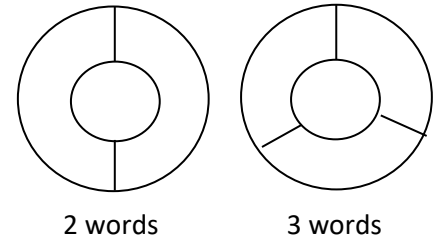
9. A Venn diagram to compare and contrast the two terms

Back of card

10. Write the definition of the words 5 times
  - ✚ Memorize the definition first
  - ✚ Each time you write the definition, cover up what you have written to ensure you are writing the definition from memory rather than copying the definition over and over
  - ✚ The definition for a muscle is the origin, insertion, and action of the muscle

6) **Bull's Eye comparison 2 or 3 words (counts for 2 to 3 words)**

1. **Write your name, period, and M#6 in the upper right hand corner of an 8.5 X 11" piece of paper**
2. Compare and contrast two or three topics
  - ✚ differences between the topics belong in the outside sections
  - ✚ Similarities between the topics belong in the center
  - ✚ Words, pictures, graphs, equations, etc. should be used
3. The diagram must include a minimum of 4 colors
  - ✚ the colors must be used to emphasize similarities and differences
4. Write a 4-6 sentence paragraph that explains how the diagram shows similarities and differences and how the colors help clarify the similarities and differences



**7) Four Window Concept Riddle (counts for 4 vocabulary words)**

1. Start with an 8.5 X 11” piece of paper in the landscape position
2. Fold the paper by bringing the two ends to the center of the paper
3. The result should be a 5.5 X 8.5” paper with two flaps that are like shutters covering a window
4. Cut the two flaps (shutters) in half so you have 4 flaps (windows)
5. **Write your name, period, and M#7 in the upper right hand corner of the upper right front flap**

Riddle 1	Riddle 2
Illustration	Illustration
Riddle 3	Riddle 4
Illustration	Illustration

**Front Four Flaps**

6. Select 4 terms (vocabulary words, processes, phrases, etc. that are related to a single fact)
  7. Place a riddle on the front of each flap
- ✚ Illustrate the riddle

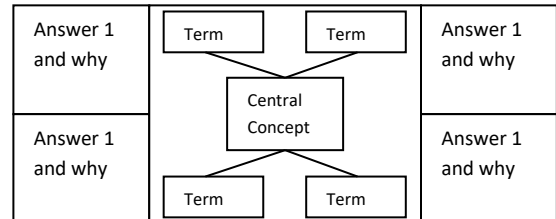
**Inside flaps (windows)**

8. Write the answer to each riddle
- ✚ Explain the answer to the riddle

**Inside center**

9. Make a concept map with the terms as spokes connecting to the central concept

- ✚ Write the reason the term is connected to the central concept on the line connecting the term to the concept



**8) Fables (counts for up to 3 vocabulary words)**

A fable is a short story that teaches a moral or lesson.

1. **Write your name, period, and M#8 on the front of an 8.5 X 11” piece of paper in the upper right hand corner**

**The fable**

2. 3 paragraphs
3. The vocabulary words used in the fable must be highlighted

**The moral or lesson**

4. Write the moral or lesson after the last paragraph
5. Illustrate the moral or lesson

**Explanation**

6. Below the illustration, explain how the fable and illustration teach the vocabulary words
7. Your explanation must be at least 3 sentences per vocabulary word

## 9) Limerick

### Limerick format

1. A limerick has exactly 5 lines
2. The last words of the first, second, and fifth lines rhyme with each other
3. The first, second, and fifth lines are longer than the third and fourth lines
4. The last words of the third and fourth lines rhyme with each other
5. The pattern of sounds follows the following: Da DUM da da DUM da da DUM

### Limerick

1. **Write your name, period, and M#9 in the upper right hand corner of an 8.5 X 11" piece of paper**
2. The form and pattern of limerick writing must be followed
3. The limerick must be G or PG rated
4. The vocabulary words must be addressed in the limerick

### Illustration

5. An illustration about the vocabulary words must follow the limerick
6. Use at least 4 colors

### Explanation

7. A 3 to 5 sentence explanation of how the limerick and the illustration are related to the vocabulary words

## 10) Haiku

Haiku is a minimalist, contemplative poetry form from Japan that emphasizes nature, color, season, contrasts, and surprises. It usually has 3 lines and 17 syllables distributed in a 5, 7, and 5 syllable pattern. It should show a sensation, impression, or drama of a specific fact or vocabulary word.

### Haiku

1. **Write your name, period, and M#10 in the upper right hand column of an 8.5 X 11" piece of paper**
2. The form and pattern of a haiku must be followed

### Illustration

3. An illustration about the fact or vocabulary word must follow the haiku
4. Use at least 4 colors

### Explanation

5. A 3 to 5 sentence explanation of how the haiku and the illustration are related to the vocabulary word

### 11) Cinquain

A cinquain is a five-line poem written about a single concept, object, or idea. An American poet developed cinquains after examining the Japanese haiku format. The format is a short, unrhymed poem of twenty-two syllables and five lines. The five lines contain 2, 4, 6, 8, then 2 syllables. Each line is supposed to deal with a specific aspect of the cinquain's topic.

Raindrop  
Moisture, Falling  
Sustain, Nourish, Cleansing  
Teardrop, Diamond, Dropping, Earthward  
Dewdrop

1. The first line consists of two syllables (a one word title)
2. The second line consists of four syllables (2 words describing the title)
3. The third line consists of six syllables ( 3 words stating action)
4. The fourth line consists of eight syllables (4 words expressing a feeling)
5. The last line consists of two syllables (1 word that is another word for the title)

Cinquain

1. **Write your name, period, and M#11 in the upper right hand column of an 8.5 X 11" piece of paper**
2. The form and pattern of a cinquain must be followed

Illustration

3. An illustration about the fact or vocabulary word must follow the cinquain
4. Use at least 4 colors

Explanation

5. A 3 to 5 sentence explanation of how the cinquain and the illustration are related to the vocabulary word

### 12) Tee Shirt Design

Design artwork for a tee shirt that represents a vocabulary word

1. **Write your name, period, and M#12 in the upper right hand corner of an 8.5 X 11" piece of paper**

Front of shirt

2. Artwork that represents the vocabulary word or fact
3. Must use at least 4 colors

Back of shirt

4. A 1 or 2 line cute or clever saying using the vocabulary word or fact  
✚ must be G or PG appropriate

The explanation

5. A 2 paragraph explanation of how the tee shirt represents the vocabulary word or fact  
✚ 1 paragraph for explaining how the artwork represents the vocabulary word or fact  
✚ 1 paragraph for explaining how the saying represents the vocabulary word or fact

### 13) Acrostic Poem

An acrostic poem, sometimes called a name poem, uses a word for its subject. Then each line of the poem begins with a letter from the subject word. This type of poetry doesn't have to rhyme.

Acrostic Poem

1. **Write your name, period, and M#13 in the upper right hand corner of an 8.5 X 11" piece of paper**
2. The form and pattern of an acrostic poem must be followed

Illustration

3. An illustration about the fact or vocabulary word must follow the poem
4. Use at least 4 colors

Explanation

5. A 3 to 5 sentence explanation of how the poem and the illustration are related to the vocabulary word

#### 14) Song, Rap, or Rhyming Poem

1. **Write your name, period, and M#14 in the upper right hand corner of an 8.5 X 11" piece of paper**

Illustration

2. An illustration about the fact or vocabulary word must follow the song, rap, or poem
3. Use at least 4 colors

Explanation

4. A 2 to 3 paragraph explanation of how the song, rap, or poem and the illustration are related to the vocabulary word

#### 15) Vehicle Name

As part of a design team for a new model vehicle, you must select a name for the model. The name must reflect the vehicle's abilities, which must be related to a vocabulary word

The Vehicle

1. **Write your name, period, and M#15 in the upper right hand corner of an 8.5 X 11" piece of paper**
2. Come up with a model name for the vehicle that is inspired by a vocabulary word or fact
3. Explain how the model name of the vehicle fits its abilities

Magazine Advertisement

4. Write an advertising slogan to be used to represent and show the vehicle's features
5. Create an advertisement showing the vehicle emphasizing its features and name

Explanation

6. Explain in 2 to 3 paragraphs how the slogan and the advertisement represent the vocabulary word

#### 16) Letter to the Editor

1. **Write your name, period, and M#16 in the upper right hand corner of an 8.5 X 11" piece of paper**

The letter

2. The letter must be 2 to 3 paragraphs long
3. Each use of the vocabulary word must be highlighted
4. State your opinion in the first paragraph
5. Use at least 5 specific facts to support your opinion

Illustration

6. An illustration that captures your opinion stated in the first paragraph
7. You must use at least 4 colors

Explanation

8. Explain how the letter and illustration are related to the vocabulary word in 3 to 5 sentences

### 17) People in Your neighborhood Flip Book (minimum of 4 vocabulary words)

Select a word and imagine it as if it represents a person in a neighborhood. Describe the people (words) that live in the neighborhood. Each person (a minimum of 4) is described on one of the pages of the flip book. **Write your name, period, and M#17 on the front page of the book.**

Making the Flip Book

1. Your book must include at least 4 pages
2. Each page must be exactly 6cm by 12cm
3. Staple the pages together at the top

Front of each page

4. Draw and color a picture of the person in appropriate work or leisure clothing
5. Write the name of the person across the bottom of the flip page

Back of each page

6. Write the name of the person across the top of the flip page
7. Describe the job or workplace of the person
8. Explain how the job or workplace fits the person's name
9. Explain how the person's job helps the neighborhood function

Staple here

Bottom

### 18) Newspaper Article

1. **Write your name, period, and M#18 in the upper right hand corner of an 8.5 X 11" piece of paper**

The Article

2. Must be 2 to 3 paragraphs
3. Must contain the How, Who, What, When, Where, and Why about the vocabulary word
4. Must contain at least two interesting facts people could use in common conversations

The Illustration

5. Must represent the vocabulary word
6. Must have at least 4 colors
7. Must have a caption of 2 to 3 sentences explaining the graphic

### 19) Tattoo or Body Art

You are in charge of developing a tattoo to allow the world to know about one of the vocabulary words or facts

1. **Write your name, period, and M#19 in the upper right hand corner of an 8.5 X 11" piece of paper**

The Tattoo

2. The centerpiece of the tattoo must have a slogan or phrase as part of the tattoo
3. The surrounding artwork must demonstrate the vocabulary word in a real life situation
4. You must use at least 4 colors
5. The artwork must be suitable for all ages and appropriate for viewing in all social situations
6. The best location of the tattoo on the body must be written underneath the tattoo

The Explanation

7. 2 to 3 paragraphs
8. Explain how the artwork represents the vocabulary word
9. Explain why the tattoo belongs on a particular part of the body

## 20) Design a Clothing Line

You are a fashion designer and owner of a clothing company. Your next line of clothing will be named after a vocabulary word

1. **Write your name, period, and M#20 in the upper right hand corner of an 8.5 X 11" piece of paper.**

The logo

2. Design a logo that has the name of the new clothing line on it somewhere
3. The logo must use or apply the vocabulary word

Illustration

4. Illustrate one article of clothing from the new clothing line
5. The logo must appear somewhere on the article of clothing
6. You must use at least 4 colors

The Explanation

7. 3 paragraphs
  - ✚ 1 paragraph describing how the article of clothing represents the vocabulary word
  - ✚ 1 paragraph that explains how the name of the clothing line will help sell it
  - ✚ 1 paragraph that explains how the illustration represents the vocabulary word and how wearing the clothing would help a student learn the word

## 21) Design a Toy

Apply your knowledge of fun and science to design the hottest and best-selling toy of the season. Use a vocabulary word or fact for inspiration. The toy cannot cause serious bodily injury as part of its normal use.

1. **Write your name, period, and M#21 in the upper right hand corner of an 8.5 X 11" piece of paper**

The toy

2. Name the toy
3. What is the vocabulary word used when playing with the toy?
4. What are the most fun features of the toy?
5. What age group is the toy designed to reach?
6. How will playing with the toy help teach the vocabulary word

The illustration

7. Consider #'s 3-6 above when you illustrate the toy being used by a happy customer
8. Write a slogan for advertising the toy above the illustration
9. Use a minimum of 4 colors

The Explanation

10. 1 paragraph explaining how the slogan will help market the toy
11. 1 paragraph explaining how playing with the toy will help the user learn the vocabulary word

## 22) Public Service Announcement

You are charged with writing a public service announcement for the radio. The topic is one of the vocabulary words.

1. **Write your name, period, and M#22 in the upper right hand corner of an 8.5 X 11" piece of paper**

The announcement

2. Must be no less than 20 seconds and no more than 30 seconds when read aloud
3. The word must be mentioned at least twice during the announcement
4. A description of any sound effects or music that would accompany the commercial should be listed in parentheses and highlighted inside the body of the announcement
5. After the announcement, there must be a one sentence declaration of the organization responsible for developing the public service announcement

The Explanation

6. Explain how and why the public service announcement would help people understand the word

### 23) Pet Name

You are the proud owner of a new and unique pet. You decide to name the pet after one of your vocabulary words.

1. **Write your name, period, and M#23 in the upper right hand corner of an 8.5 X 11" piece of paper**
2. Name the pet after one of your vocabulary words

The illustration

3. Draw your pet doing a trick that represents its name
4. You must use at least 4 colors

The Explanation

5. 1 paragraph explaining how the behavior of the pet fits its name
6. 1 paragraph that describes the trick you illustrated and explains how the trick represents your pet's name (the vocabulary word)

### 24) Design a Magazine Advertisement

Design a magazine advertisement about a vocabulary word

1. **Write your name, period, and M#24 in the upper right hand corner of an 8.5 X 11" piece of paper**

The Advertisement

2. Identify the magazine the ad will be placed in
  - ✚ The magazine must be appropriate of teenagers
3. The standard header and footer used by the magazine must be placed above and below the ad
4. The ad must be no more than half a page
  - ✚ Include claims, selling points, guarantees, etc. about the vocabulary word
  - ✚ Illustrations, diagrams, graphs, etc. must occupy at least half of the ad
5. Use at least 4 colors

The Explanation

6. A 2 to 3 paragraph explanation of how the ad explains the vocabulary word
  - ✚ explain why the magazine was selected to be advertised in
  - ✚ explain how the artwork helps explain the vocabulary word
  - ✚ explain how the claims, selling points, etc. help develop understanding of the vocabulary word





## Conversation Starters (for group work and argumentation sessions)

- 1) What other things did you try?
- 2) I noticed \_\_\_\_\_.
- 3) For these reasons \_\_\_\_\_ I think \_\_\_\_\_.
- 4) I don't know if I agree with \_\_\_\_\_ because \_\_\_\_\_.
- 5) I disagree with \_\_\_\_\_ because \_\_\_\_\_.
- 6) Would \_\_\_\_\_ be better if \_\_\_\_\_?
- 7) One way to modify \_\_\_\_\_ is \_\_\_\_\_.
- 8) I have a question about \_\_\_\_\_.
- 9) How do you know \_\_\_\_\_?
- 10) Why did you decide to do \_\_\_\_\_?
- 11) \_\_\_\_\_ could be improved if \_\_\_\_\_.
- 12) Is \_\_\_\_\_ always that way?
- 13) What evidence do you have for \_\_\_\_\_?
- 14) Is there another possible solution?

## The 4 Ground Rules of Critique in Science

### (1) Be Respectful

Critique is how we identify errors or flaws in our ideas. In science, we always critique ideas, not people. When we are critiquing ideas, we never say hurtful things.

### (2) Be Specific

Even if you are being respectful, you are not doing anybody any favors if you are vague. In science, we always make specific and detailed comments about what needs to be improved.

### (3) Be Helpful

Critique is more than identifying a flaw or error in an idea; it is also about offering suggestions for ways to improve it. In science, we always offer specific and detailed suggestions for how to make things better.

### (4) Use Scientific Criteria

Scientists use empirical and theoretical criteria to determine if an idea is valid or acceptable. In science, we always use scientific criteria to critique arguments and reports.

## ADI Investigation Proposal TGB Version

Guiding Question:

Claim:

Alternative claims:

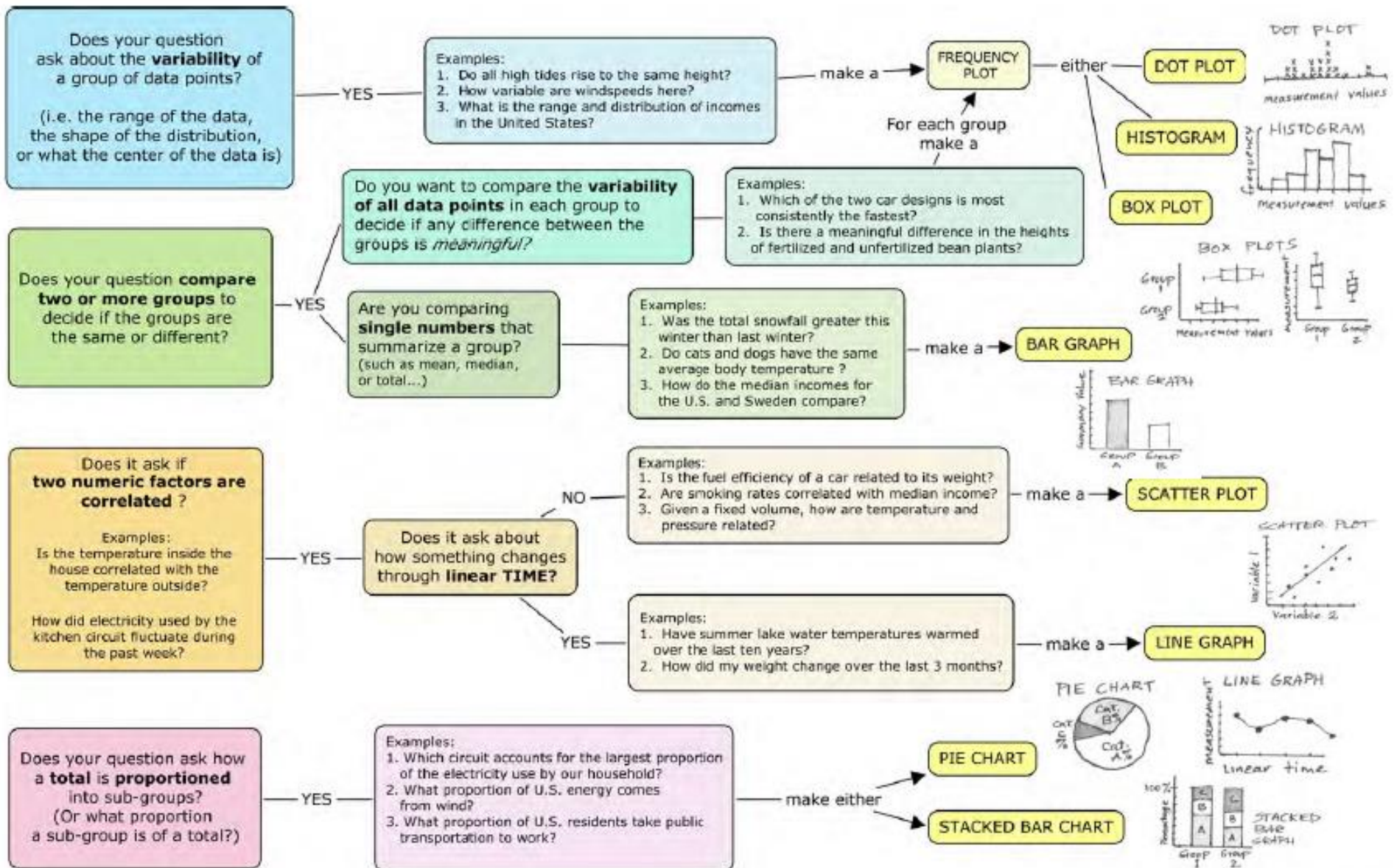
Procedure:

What data will you collect?

How will this data help you answer the guiding question?

What safety precautions will you follow?

# Graph Choice Chart



Variability questions: Frequency plot (3 kinds)	Dot plot	Box & whisker plot	Histogram
<p>Kind of data:  <b>One categorical group and            One numeric variable (one axis)</b></p> <p>Frequency plots show how variable the group is. Describe variability by range, measure of center (mean, median, or mode), and the shape of the distribution.</p>	<p>Atlantic storms--2013</p>	<p>Atlantic storms</p>	<p>Atlantic storms</p>

Comparing groups questions:	Frequency plots	OR	Bar graph
<p>Kind of data:  <b>Two or more categorical groups &amp;            One numeric variable</b></p> <p>Frequency plots allow you to compare how variable the groups are. Bar graphs only show a single number (ie. sum, average, percent or count) for each group.</p>	<p>Atlantic storms</p> <p>(To compare two groups of values)</p>	<p>Atlantic storms</p> <p>(To compare two summary values)</p>	

- Criteria for an informative graph:
- \_\_\_ Graph type fits the question
  - \_\_\_ Axes are drawn & scaled correctly
  - \_\_\_ Axes are labeled clearly, correctly
  - \_\_\_ Units are given
  - \_\_\_ Data are plotted accurately
  - \_\_\_ Legend is present, if needed
  - \_\_\_ Graph is overall neat & legible
  - \_\_\_ Title and/or caption present
  - \_\_\_ Trend line shown (scatter plot or line graph only)
  - \_\_\_ Graph helps answer the question

Correlation questions:	Scatter plot	OR	Line graph (for time series)
<p>Kind of data:  <b>Two numeric variables</b></p> <p>Both variables must be continuously numeric. Connect dots only if one variable is linear time (i.e. days, years...) Put time on the X-axis. Show correlation with a 'line of best fit'.</p>	<p>Atlantic storms</p>	<p>Number of storms per year</p>	

Proportion (percentage) questions:	Pie chart	OR	Stacked bar graph
<p>Kind of data:  <b>Size of a subgroup as a percentage of the whole group (Total of sub-groups must = 100%)</b></p> <p>In pie charts and stacked bar graphs, all sub-group percentages must total 100%.</p>	<p>FARM INCOME SOURCES IN 2014</p>	<p>Sources of farm income</p>	

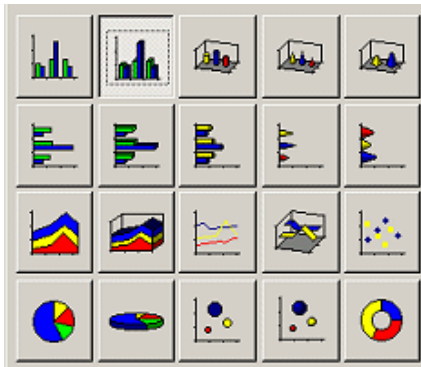
(There are other kinds of questions and other kinds of graphs, and often more than one graph type is useful for a given question. Learn to graph data for these basic kinds of questions first.)

## Guiding Question:



Our Claim:

### Our Evidence:



- This graph indicates...
- This graph shows...
- This graph suggests...

ANALYSIS  
ILLUSTRATE A  
TREND,  
DIFFERENCE, OR  
A RELATIONSHIP  
AND DESCRIBE IT

INTERPRETATION  
EXPLAIN WHAT THE  
ANALYSIS MEANS

### Our Justification of the Evidence:

USE YOUR SCIENTIFIC KNOWLEDGE AND  
ANALYSIS TO SUPPORT YOUR INTERPRETATION

The 3 elements of a valid  
justification:

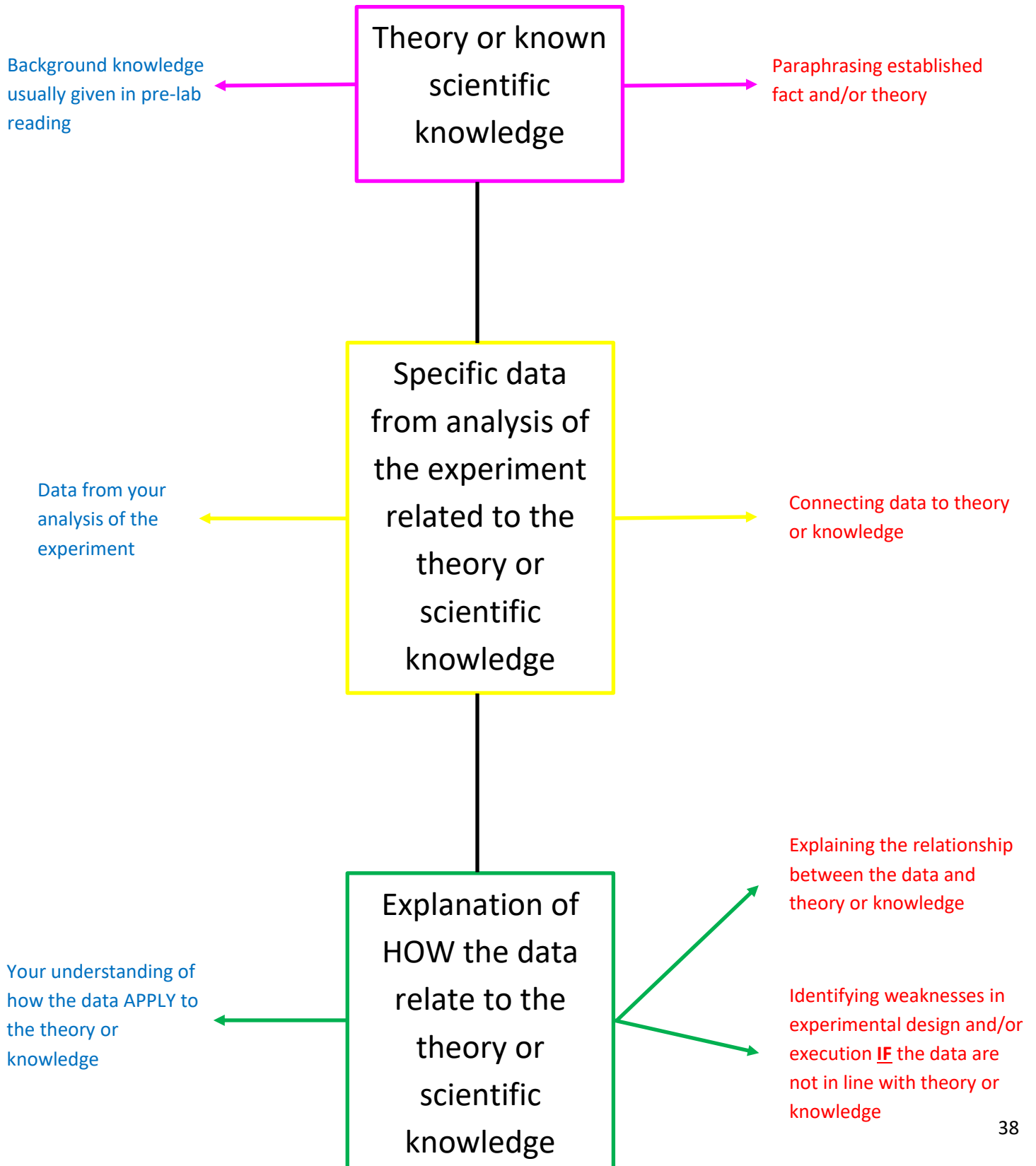
- 1) Theory or known scientific knowledge
- 2) Specific data from experiment related to the theory or scientific knowledge
- 3) Explanation of HOW the data relate to the theory or scientific knowledge

REASON  
EXPLAIN WHY  
THE EVIDENCE  
MATTERS AND  
HOW IT RELATES  
TO ESTABLISHED  
SCIENTIFIC  
KNOWLEDGE

# The 3 Elements of a Valid Justification

## WHAT IT IS

## WHAT YOU ARE DOING



## Argumentation Sample Questions

- 1) Why did you do \_\_\_\_\_? (reference a specific step in their procedures)
- 2) Why didn't you \_\_\_\_\_ (suggest a specific method, technique, etc. that could have been part of the procedure)
- 3) Why does \_\_\_\_\_ (reference specific evidence used) matter?
- 4) Why is \_\_\_\_\_ (reference specific evidence used) important?
- 5) What variables did you control for?
- 6) Why did you control for \_\_\_\_\_? (reference a specific variable controlled for)
- 7) What variables were NOT controlled for?
- 8) How could you have controlled for \_\_\_\_\_? (reference a specific variable that was not controlled for)
- 9) What are the strengths of your experimental design?
- 10) What could have made your experimental design better?
- 11) Why did you choose to collect \_\_\_\_\_? (reference specific data collected)
- 12) Why didn't you collect data on \_\_\_\_\_?
- 13) What is the relationship between the independent variable and the dependent variable?
- 14) How does your data support your claim?
- 15) How confident are you in your claim and why?
- 16) Why did you choose to illustrate your data with a \_\_\_\_\_? (reference the type of chart they used (scatter plot with best fit line, histogram, bar chart, etc.))
- 17) Why did you organize your data table the way you did?
- 18) What could you have done to make your data easier to understand?
- 19) What data would have strengthened your claim?
- 20) What statistics did you use to support your claim?
- 21) What statistics could you have used to strengthen your claim?

## Argumentation Session Rubric

10 points	8 points	6 points	4 points	0 points
Asked several challenging and original questions at each station	Asked several challenging and original questions	Asked a few questions from the sample list at each station	Asked a few questions from the sample question list	Did not ask questions

## Argumentation session feedback



*We want to be helpful and supportive so everyone can get the most out of each scientific experience. Leave one positive comment and one respectful suggestion for improvement for each group you visit during an argumentation session.*

We like this because...

We suggest that you change this to...

We suggest you add...

Will you clarify...?



# Guide for writing an investigative report



## Section 1: The introduction

What are you trying to do and why?

Be sure to:

- Provide a context for the investigation
- Explain the task
- Make the guiding question clear



You can find this information in the introduction to the lab handout

## Section 2: The method

What did you do and why did you do it that way?

Be sure to explain...

- How you collected your data and why you decided to do it that way
- What type of data you collected and why you collected that data
- How you analyzed your data and why you decided to analyze it that way



You can find this information in the introduction to the lab handout

## Section 3: The argument

What is your argument?

Be sure to...

- Provide your claim
- Support your claim with evidence
- Use a figure to present your evidence and reference it
- Provide a justification for your evidence



You can find all this information on your white board

\*must include a data table and graph

\*\*no more than 2 pages typed, double spaced, 12 point font, 1 inch margins (all around)

## ADI Investigation Report Peer Review Guide-TGB version

Report by \_\_\_\_\_











Reviewed by \_\_\_\_\_ Reviewed by \_\_\_\_\_ Reviewed by \_\_\_\_\_

YOU MUST ADDRESS THE FOLLOWING WORDS AND CONCEPTS IN YOUR INTRODUCTION:	<b>Section 1: Introduction and Guiding Question</b>		<b>Reviewer Rating</b>		
	Is there enough background information and is it accurate?		<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
	Is the guiding question explicit and did the author <b>EXPLAIN HOW</b> the question is related to the background information?		<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
	Reviewers: <b>EXPLAIN HOW</b> the author could improve this part of his or her report.	Author: What revisions did you make in your report?			
<b>Section 2: Method</b>					<b>Reviewer Rating</b>
Did the author describe the procedures and <b>EXPLAIN WHY</b> the procedures were used?			<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
Did the author describe what data were collected and <b>EXPLAIN WHY</b> the data were collected?			<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
Reviewers: <b>EXPLAIN HOW</b> the author could improve this part of his or her report.		Author: What revisions did you make in your report?			

Section 3: The Argument		Reviewer Rating		
Did the author make a claim consistent with the evidence that answers the guiding question?		<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
Quality of Evidence	Did the author describe how he/she analyzed the data and <b>EXPLAIN WHY</b> the analysis helped him/her answer the guiding question?	<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
	Is the analysis of the data appropriate and free from errors?	<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
	Is the author's interpretation of the analysis valid?	<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
	<b>MANDATORY DATA</b>	<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
Presentation of Evidence	Are tables and graphs correctly formatted, labeled, and are metric units used?	<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
	Are specific values from tables and graphs referenced in the body of the text?	<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
Justification of Evidence	Did the author state <b>WHAT</b> scientific concept is being defended?	<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
	Did the author <b>DESCRIBE</b> the data from their analysis used as evidence in support of the scientific concept?	<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
	Did the author <b>EXPLAIN HOW</b> the evidence supports the underlying scientific concept?	<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
Did the author <b>EXPLAIN HOW</b> his or her claim agrees with the claims made by other groups and <b>PROVIDE REASONS</b> for disagreements?		<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
Reviewers: <b>EXPLAIN HOW</b> the author could improve this part of his or her report.		Author: What revisions did you make in your report?		
<b>Mechanics</b>		<b>Reviewer Rating</b>		
<b>Organization:</b> Is each section easy to follow? Do paragraphs include multiple sentences: Do paragraphs begin with a topic sentence?		<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
<b>Grammar:</b> Are the sentences complete? Is there proper subject-verb agreement in each sentence? Are there run-on sentences?		<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
<b>Conventions:</b> Did the author use appropriate spelling, punctuation, paragraphing and capitalization:		<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
<b>Word Choice:</b> Did the author use the appropriate words (e.g., there vs. their, to vs. too, than vs. then, etc.)?		<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input type="checkbox"/> Yes
<b>Fluency:</b> Does the paper as a whole flow well? Do the sections follow each other to give a complete idea of the lab?		<input type="checkbox"/> No	<input type="checkbox"/> Partially	<input checked="" type="checkbox"/> Yes

## Peer Review Feedback



If you think the author...	Weak Feedback 	Strong Feedback 
...wrote something that was inaccurate.	That is not right. 	We disagree with _____. We think you should change it to _____. 
...needs to make a change to a table, graph or figure.	Fix this. 	We think you need to reorganize your _____. Here is how we would change it: _____. 
... forgot to include something important	Write more. 	We suggest adding _____ and _____. 
... included an important piece of information, but did not provide enough details about it.	Add more detail. 	We think you need to be more specific about _____. We suggest making the following changes: _____. 

## Annotating text

Annotating Text	
<input type="checkbox"/>	<u>UNDERLINE</u> concepts you think might be useful for understanding or solving the problem
<input type="checkbox"/>	<b>Box</b> information you think might be helpful for designing your investigation
<input type="checkbox"/>	← Write <b>notes</b> in the left margin
<input type="checkbox"/>	→ Write <b>questions and answers</b> in the right margin
Each paragraph must have something underlined or boxed, <b>AND</b> have something written in the margins (a question and/or note).	

# Unit 01: The Human Body



For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

**Can** – I can demonstrate I’ve learned the objective.

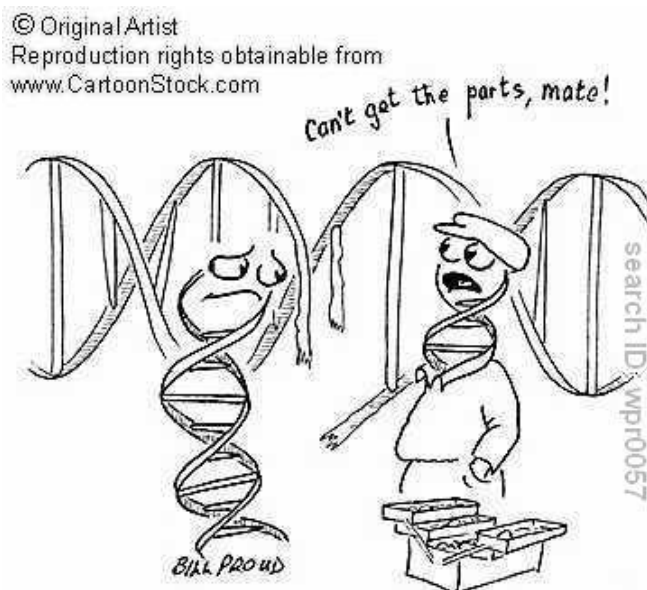
**Think**– I think I can demonstrate I’ve learned the objective.

**Cannot** – I cannot demonstrate I’ve learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
1. How does the organization of the human body reveal the relationship between structure and function?		
2. Why does anatomy and physiology need a special language?		
3. How does your body maintain homeostasis?		



## Unit 02: Biochemistry



Genetic Engineer.

For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

**Can** – I can demonstrate I've learned the objective.

**Think** – I think I can demonstrate I've learned the objective.

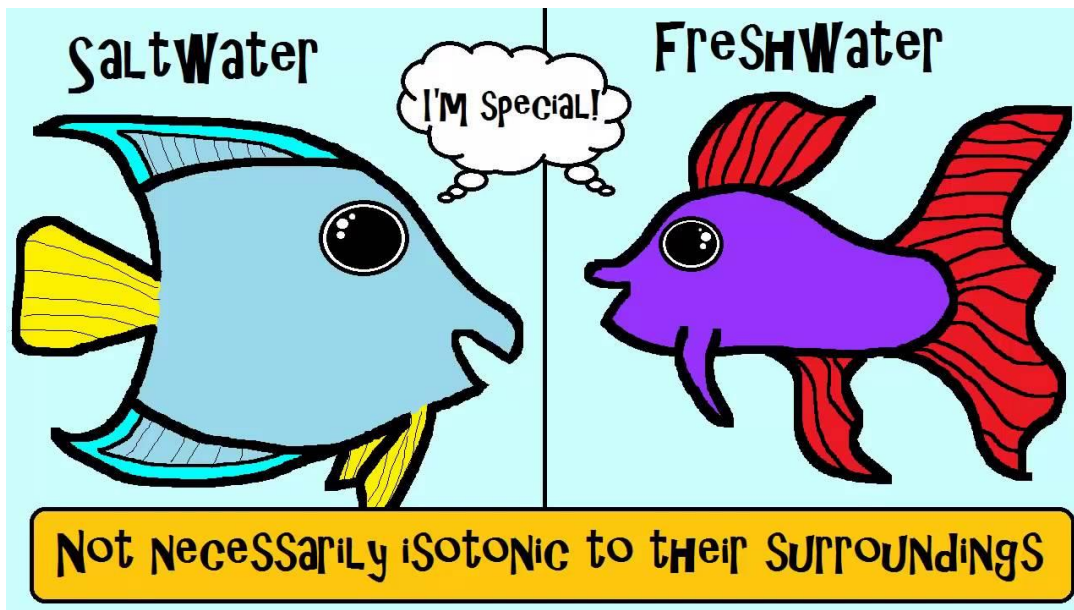
**Cannot** – I cannot demonstrate I've learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
4. What is the relationship between energy and matter?		
5. How does ATP power cellular work?		
6. What is the relationship between metabolism and homeostasis?		
7. How do the major molecules of life form, and what do they do?		
8. Why does life as we know it depend on water?		
9. What causes pH change?		





# Unit 03: Cell Homeostasis



For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

**Can** – I can demonstrate I’ve learned the objective.

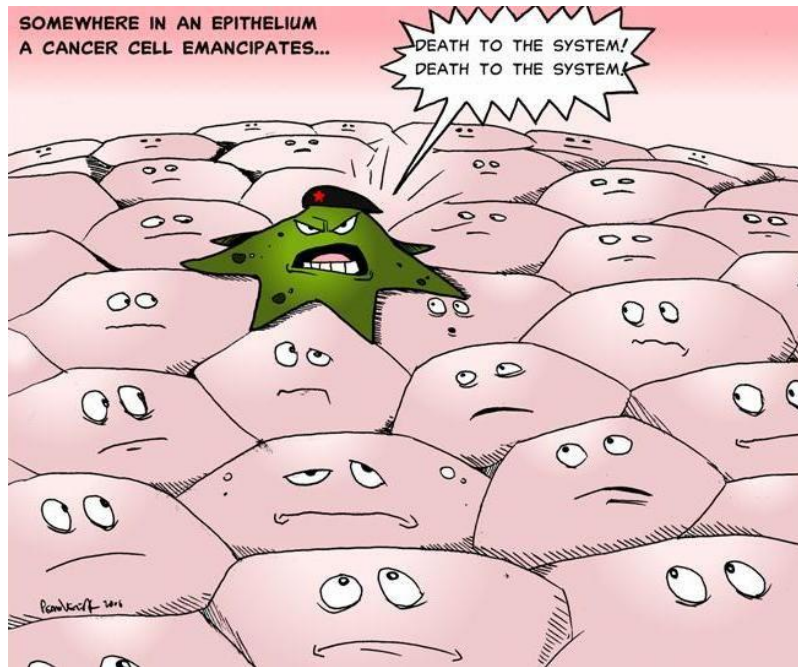
**Think**– I think I can demonstrate I’ve learned the objective.

**Cannot** – I cannot demonstrate I’ve learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
10. Why is the plasma membrane referred to as a fluid mosaic?		
11. How do substances that are permeable to the plasma membrane get into and out of cells?		
12. How do impermeable substances get into and out of cells?		
13. How do cells “talk” to each other?		
14. How does the endomembrane system regulate protein and other cell product traffic?		



# Unit 04: Skin and Body Membranes



For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

**Can** – I can demonstrate I’ve learned the objective.

**Think**– I think I can demonstrate I’ve learned the objective.

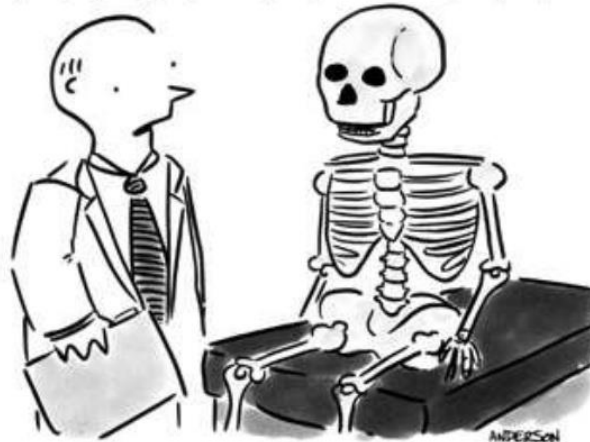
**Cannot** – I cannot demonstrate I’ve learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
15. Why doesn't my skin tear apart when someone pulls me from my forearm?		
16. How are organs protected?		
17. How are organs and organ systems organized?		
18. How do the structures of the integumentary system determine its function?		
19. How does injury and cancer affect function and homeostasis of the integumentary system?		



# Unit 05: Skeletal System

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"Still, let's do an x-ray just to be sure."

For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

**Can** – I can demonstrate I've learned the objective.

**Think** – I think I can demonstrate I've learned the objective.

**Cannot** – I cannot demonstrate I've learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
20. What are the functions of the axial and appendicular skeleton systems?		
21. How are compact and spongy bone similar and different?		
22. How does bone form and how is bone formation regulated?		
23. How does the skeleton move?		
24. What are the bones and landmarks of the skull?		
25. What are the bones and landmarks of the vertebral column and thoracic cage?		
26. What are the bones and land marks of the pectoral girdle, arm, and hand?		
27. What are the bones and land marks of the pelvic girdle, leg, and foot?		



# Unit 06: Muscular System

For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

**Can** – I can demonstrate I’ve learned the objective.

**Think**– I think I can demonstrate I’ve learned the objective.

**Cannot** – I cannot demonstrate I’ve learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
28. How does the structure of muscle tissue relate to its function?		
29. How does the structure of muscle cells relate to their function?		
30. How does the nervous system control muscle contraction?		
31. How does a muscle fiber contract?		
32. Where does the energy for cross bridge formation come from?		
33. How do muscles move bone?		
34. What are the muscles of facial expression and mastication?		
35. What are the muscles that move the head and pectoral girdle?		
36. What are the muscles that move the vertebral column?		
37. What are the muscles that move the arm and forearm?		
38. What are the muscles that move the hand and fingers		
39. What are the muscles that move the thigh?		
40. What are the muscles that move the leg?		
41. What are the muscles that move the foot?		





# Unit 07: Nervous System



For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

**Can** – I can demonstrate I’ve learned the objective.

**Think**– I think I can demonstrate I’ve learned the objective.

**Cannot** – I cannot demonstrate I’ve learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
42. How do neurons “talk” to each other?		
43. How does the brain handle complex and simple tasks?		
44. How does the structure of the central nervous system (CNS) fit its function?		
45. Why is nicotine so addictive?		



# Unit 08: Endocrine System



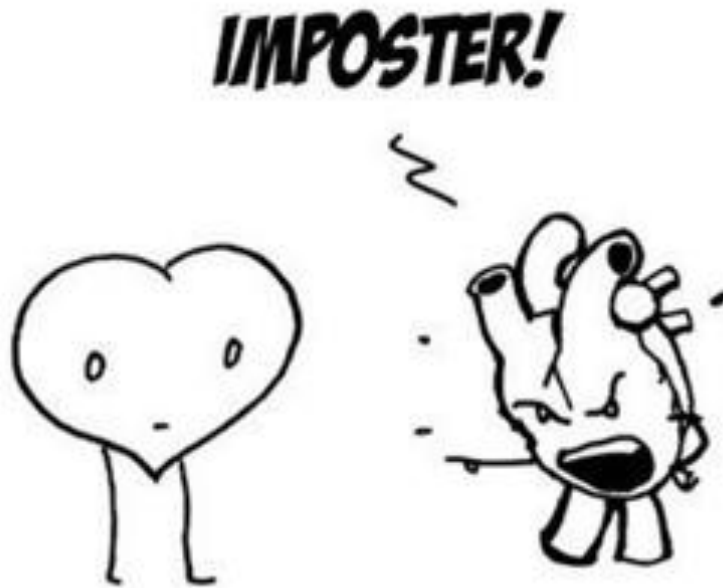
For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

- Can** – I can demonstrate I’ve learned the objective.
- Think**– I think I can demonstrate I’ve learned the objective.
- Cannot** – I cannot demonstrate I’ve learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
46. How does the endocrine system coordinate and direct cell activity?		
47. Why do people pee a lot when they drink beer?		
48. Why do West Coast teams hate playing East Coast teams at 1pm (especially in the playoffs)?		
49. How does the structure of the adrenal cortex and adrenal medulla effect their role in the stress response?		
50. How does the fight or flight response provide evidence for common ancestry among mammals?		
51. How does type II diabetes affect blood glucose homeostasis?		
52. How is spermatogenesis controlled?		
53. How does “the pill” prevent pregnancy?		



# Unit 09: Cardiovascular System



For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

**Can** – I can demonstrate I’ve learned the objective.

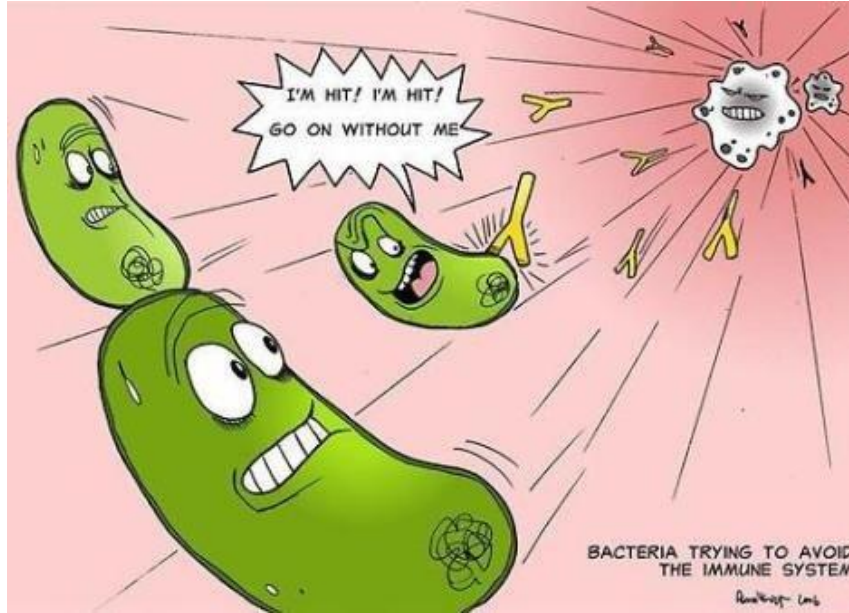
**Think**– I think I can demonstrate I’ve learned the objective.

**Cannot** – I cannot demonstrate I’ve learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
54. How does the structure of the heart contribute to its efficiency?		
55. How do EKGs illustrate how a heart functions?		
56. What causes blood pressure and how does it affect capillary exchange?		



# Unit 10: Lymphatic System



For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

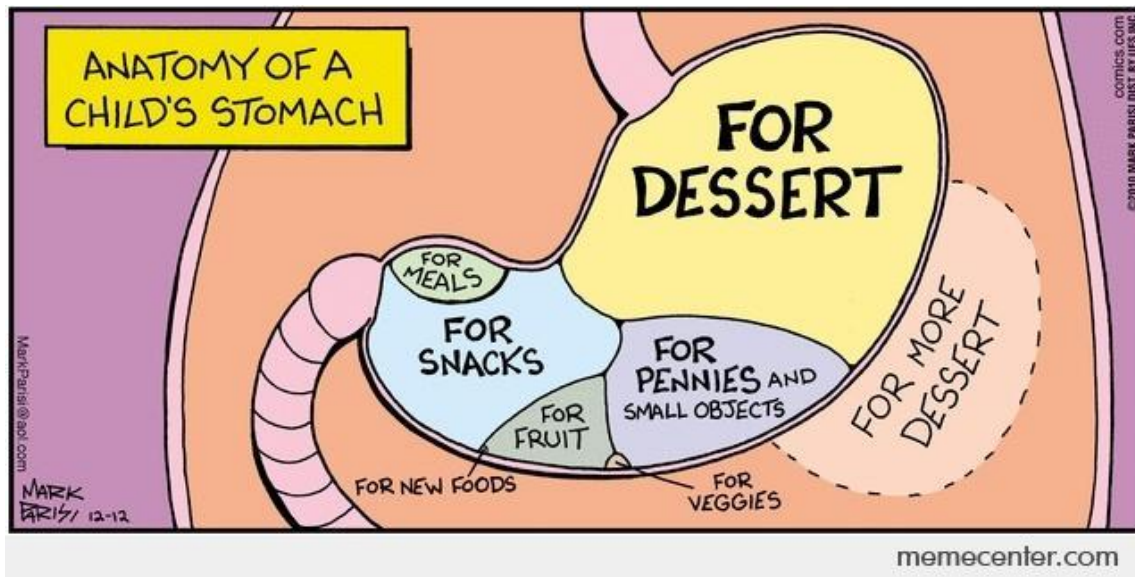
- Can** – I can demonstrate I’ve learned the objective.
- Think**– I think I can demonstrate I’ve learned the objective.
- Cannot** – I cannot demonstrate I’ve learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
57. How does the complexity of the human immune response compare to that of other types of organisms?		
58. How is the human immune system structured?		
59. How does the innate immune system protect against pathogens?		
60. How does the cell mediated immune system protect against pathogens?		
61. How does the humoral adaptive immune system protect against pathogens?		
62. How do white blood cells know not to attack your own cells?		
63. How do vaccines work?		





# Unit 11: Digestive System



For each of the **Essential Questions**, indicate your comprehension level by filling in the appropriate code from the choices below.

**Can** – I can demonstrate I’ve learned the objective.

**Think**– I think I can demonstrate I’ve learned the objective.

**Cannot** – I cannot demonstrate I’ve learned the objective.

Essential Question	Pre-comprehension level	Post-comprehension level
64. How is the digestive system structured and controlled?		
65. Why are humans prone to choking on their food?		
66. How does the structure of the stomach fit its function?		
67. Where and how does the vast majority of digestion occur?		
68. How does the structure of the small intestine fit its function?		
69. How are nutrients absorbed?		
70. How does the structure of the large intestine fit its function?		