

Levels of Thinking

EASY Level 1: Basic Input / Gathering Information

Complete Count Match Name Define Scan
 Observe Describe Identify List Select Recite

MEDIUM Level 2: Processing Information

Compare Contrast Sort Distinguish Explain Why Infer Sequence Analyze
Synthesize Make Analogies

HARD Level 3: Creating Your Own Ideas

Evaluate Generalize Imagine Judge Predict If/Then Speculate
 Hypothesize Forecast Idealize Apply the Principle

DUFAS Problem Solving Method

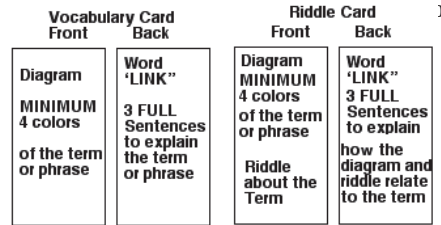
Diagram - made to show the problem
Units - and variables listed and labeled
Formula/Equation - written and ready to use
Algebra - WORK shown with numbers and units
Solution - circled and identified and **EXPLAINED**

LENSES Analysis

Label and List
Equation (R value as well)
Notice (Relationships and Patterns)
Speculate (What might be shown?)
Explain (the WHY of your ideas)
Summarize (One or more Paragraphs)

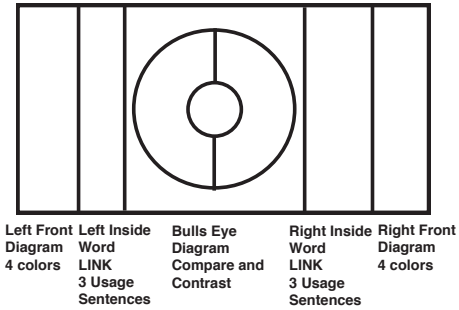
Fold It 1 – Vocabulary / Riddle Card

Front has a multi-color ILLUSTRATION representing the term.
 Back Top has the definition of the word
 A LINK (mnemonic or synonym)
 Three COMPLETE Sentences defining or using the word in context.



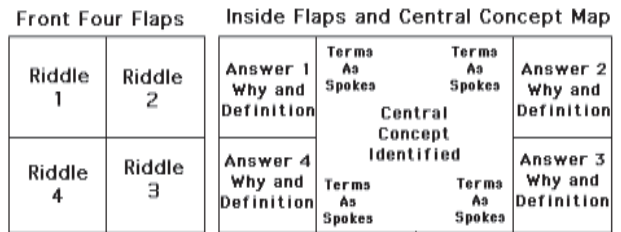
Fold It 2 – Compare and Contrast Two Terms

Tri-fold a piece of paper
 Left side–One TERM and a multi-color ILLUSTRATION
 Inside Left Side – The word, a LINK, THREE COMPLETE Sentences defining or using the word in student terms
 Right Side–One TERM and a multi-color ILLUSTRATION
 Inside Right Side – The word, a LINK, THREE COMPLETE Sentences defining or using the word in student terms
 Inside Center – A bulls-eye diagram to compare and contrast the two terms



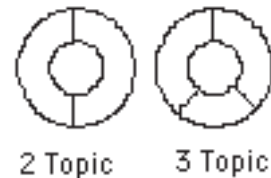
Fold It 4 – Concept Map

Tri-fold a piece of paper.
 Cut each flap in two (to form two 'doors')
 Place a riddle and a multi-color illustration on each flap
 Inside each flap, write the answer and the reason why
 In the central area, construct a CONCEPT MAP with the terms as spokes. Be sure to have the reason connecting the term to the central concept.



Bull's Eye Comparison

Compare and contrast two to three topics using a bull's eye diagram. Differences between the two topics belong on the outside sections. The similarities between the topics belong in the center bull's eye.
 A 4-color minimum ILLUSTRATION must show how the topics are related.
 A 3 – 5 sentence Explanation of how the illustration and similarities are related must be written underneath the illustration.



The Ring of Truth

Create a Ring of Truth for the assigned TERM or CONCEPT

1. Inner Circle – Write the TERM or CONCEPT being reviewed
2. Outer Circle – List specific facts, ideas and information about the TERM or CONCEPT
3. Outer Area – Write down common WRONG or INCORRECT ideas or information the Person On The Street (POTS) might have about the TERM or CONCEPT
4. Include a minimum four color diagram showing one main idea, fact or concept about the MAIN TERM or CONCEPT. Underneath the Ring of Truth, use at least 2 paragraphs to explain why the wrong ideas are incorrect and why people might have these misconceptions.



Grasping a Concept Imagine a hand with five digits around a palm. The palm holds the main concept or term. Each digit is one aspect of the concept, event, figure or topic.

- Trace your non-writing hand.
- In the palm area write the concept or term then make a simple sketch (four colors minimum) representing it.
- On each digit, write a vocabulary term, minor concept, figure, event or equation related to the term on the palm.
- At the end of each digit include a simple sketch (four colors minimum) representing what is on the digit.
- The thumb opposes the other digits, so the thumb term or concept should have a related but somewhat opposite or different slant than the other digits.
- A minimum three-paragraph explanation must be written. One paragraph must explain the sketch in the palm of the hand.
- Another paragraph must explain how the information on the digits relates to the term on the palm.
- The final paragraph must explain how the thumb information is related but is opposed to the other digits' information.

Lost or Found Make a Lost or Found poster about the assigned concept.

1. The poster must have a large (minimum 4 color) diagram representing the concept.
2. There must be a one to two paragraph description of the lost or found concept using the assigned vocabulary terms (high light the terms used).
3. Use one or two paragraphs explaining how the poster and description relate to the assigned concept.

Single Frame Cartoon Project The cartoon does NOT have to be funny

The Front of the Paper

- Single Frame cartoon (like a Farside)
- 4 colors minimum (Black and White DO NOT COUNT)
- Maximum 2 lines for a caption (speaking bubbles are okay, but not encouraged)

The Back of the Paper

- The Physics concept being shown is stated
- A paragraph explaining why or how the cartoon shows or addresses the concept stated is written

Box of Colors

As part of a campaign to make PHYSICS more color conscious, colored markers are given names describing both the color and a VARIABLE or PHYSICS CONCEPT.

1. Four basic colors must be used: Blue, Red, Green and Yellow
2. At least two additional colors must be added to the basic four.
3. Draw each marker with the name of the color and variable/concept on the label (Displacement Red and so on)
4. Write a 3 to 5 sentence description explaining how the color and the variable/concept make a natural fit.
5. Draw the outside of the box with a slogan to entice people to purchase this mix of colors and PHYSICS. A warning label must be included across the bottom of the box.

Tee Shirt Art

Design artwork for a tee shirt representing one of the assigned CONCEPTS, VARIABLES or TERMS

1. Front of Shirt must have artwork (minimum of 4 colors) showing the concept, variable or term.
2. Back of the shirt must have a 1 or 2 line 'cute or clever (but CLEAN)' saying using the concept, variable or term
3. A minimum of 2 paragraphs explaining how the artwork and saying get the PHYSICS idea across must be written.

Song or Rap

1. The song must use the assigned vocabulary or concepts. Remember: when presenting the song, be prepared to sing/play it out loud
2. There must be an illustration (4 color minimum) showing an understanding of the assigned topic and concepts.
3. There must be a 2 to 3 paragraph explanation after the song and illustration to explain how each covers and demonstrates the assigned concept and vocabulary.

Haiku Assignment

It has 3 lines and 17 syllables distributed in a 5, 7 and 5 syllable pattern.

17 syllables

5 syllables in the first line

7 syllables in the second line

5 syllables in the third line.

1. *It must follow the pattern and deal with any aspect of topic covered in class.*
2. *The section must have a border and artwork reflecting the topic - you pick the aspect you wish to emphasize in the haiku and artwork (Minimum of four colors).*
3. *There must be a short 3 to 5 sentence explanation telling how the Haiku shows an understanding of the assigned topic*

Tattoo or Body Art

You are in charge of developing a tattoo to allow the world to know about one of the assigned TOPICS or EQUATIONS.

1. The centerpiece of the tattoo must be a **slogan** representing the **concept or equation**.
2. The surrounding **artwork** (minimum of 4 colors) must demonstrate the **equation's concept in a real-life situation**.
3. The artwork must be suitable for all ages and appropriate for viewing in all social situations.
4. A **2 to 3 paragraph explanation** of how the artwork represents the equation or concept and the best location for the tattoo on the body must be written underneath the tattoo.

Equation Bookmark

1. Must be no more than 5 cm wide and 20 cm long.
2. Front must have a picture or illustration representing the main concept of the chapter (minimum of 4 colors)
3. Front must have the assigned equation
4. Back must have the assigned equation
5. Back must describe each variable in the equation
6. Back must identify the correct units for each variable in the equation
7. Back must explain how the front illustration shows the equation in use.

Limerick Assignment

General Guidelines For The Limerick Assignment

1. The form or pattern of limerick writing must be followed.
2. The limerick must be original and not copied from somewhere
3. The limerick must be G or PG-13 rated. Anything else gets you into trouble.
4. *The Physics topic or concept assigned must be addressed in the limerick*
5. *An illustration about the topic must follow the limerick (minimum of four colors).*
6. *A 3 to 5 sentence explanation of how the limerick and the illustration are related to the topic must be written after the illustration.*

The Limerick Pattern

1. A limerick has FIVE 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 pattern: Da DUM da da DUM da da DUM

Physics Topic: Heat and Energy (from the APS website)

The physics test was quite near-o,
And all thought everything was quite clear-o;
"Why study this junk
I'm sure I won't flunk,"
But then he earned an Absolute Zero

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.

1. The assigned term or word is written vertically (up and down)
2. Words, terms and concepts related to the term are written horizontally (back and forth) off the letter in the vertical term
3. An illustration representing the term or word must follow the acrostic poem.
4. A 3 to 5 sentences explaining how the horizontal words and terms AND the illustration fit the vertical term or word must follow the illustration.

People In Your Neighborhood Flip It



Front



Back

Select one of the assigned equations as a neighborhood. Now describe the people in the neighborhood. Each person has separate Flip It to be taped into the notebook.

1. Front of the Flip It – not more than 4 cm wide and 10 cm long
2. Front has a colored diagram of the person in appropriate work or leisure clothing.
3. Front has the name of the person (the variable must be part of the name) across the bottom of the Flip It.
4. The back has the name of the person across the top
5. The job or workplace of the person is described
6. How the job or workplace fits the person's name is described
7. How the job helps the neighborhood (the equation) to operate and solve problems.

Clothing Line

Your love of PHYSICS and *startling fashion sense* has you as the owner of a company offering a clothing line named after one of the assigned PHYSICS CONCEPTS.

1. Describe one item from the clothing line and how it represents the PHYSICS CONCEPT.
2. Make an illustration (minimum of 4 colors) of the article of clothing with the logo advertising the PHYSICS CONCEPT. One portion of the logo must use or apply the concept as part of the illustration.
3. Use at least 3 paragraphs to describe how the name of the clothing line will help it sell, how the illustration shows the PHYSICS CONCEPT and how wearing the clothing would help a student learn the Physics behind the concept.

Toy Design

Apply your knowledge of fun and PHYSICS to design the hottest and best selling toy of the season. It must be able to fit into a standard backpack. The toy must apply one of the assigned PHYSICS CONCEPTS and not cause serious bodily injury as part of normal use. As part of the campaign to promote sales the following information must be provided.

1. What is the name of the toy?
2. What is the basic PHYSICS CONCEPT used when playing with the toy?
3. What are the most fun features of the toy?
4. What age group is the toy designed to reach?
5. How will playing with the toy help teach PHYSICS?
6. Make an illustration of the toy being used (minimum of 4 colors) by a happy consumer.
7. Use at least 2 paragraphs to describe the slogan to sell the toy. Part of the slogan must contain an everyday application applying the toy's PHYSICS CONCEPT.

Urinal Usage - Public Service Announcement

You are charged with writing a public service announcement that could be posted on a bathroom wall on one of the assigned CONCEPTS.

1. The PSA must be NO LONGER than 30 seconds when read aloud.
2. The CONCEPT must be identified at least twice during the PSA.
3. The PSA must include at **least 5 vocabulary terms or phrases** from the current unit.
4. Each vocabulary term or phrase must be **high lighted**.
5. After the reading of the PSA, there must be a **one-sentence declaration of the organization responsible** for developing the PSA.
6. A billboard or sign illustration for the side of a bus advertising the PSA must be designed (minimum of four colors) and drawn.
7. Write a **2 to 3 paragraph long explanation** of how and why the PSA would influence people to better understand the main CONCEPT.

Radio Commercial to Review Homework - Thirty Seconds Of Fame And Glory

Write a 30 second (maximum) RADIO commercial advertising the assigned concepts or vocabulary terms.

1. The one idea or concept considered to be most important should be the main message of the commercial.
2. The commercial MUST use at least 5 vocabulary terms or phrases from the current unit (high light each term).

3. A description of any sound effects or music that would accompany the commercial may be listed in parenthesis and highlighted inside the body of the commercial.
4. An illustration showing a printed advertisement to accompany the radio campaign must be drawn (use at least 4 colors).
5. An explanation of how both the radio commercial and the printed advertisement meet the key points of the assignment must be written.

Designing A Magazine Ad

Design a magazine advertisement on one of the assigned CONCEPTS or EQUATIONS.

1. The ad is for a favorite magazine of teenagers or young adults.
2. The standard header or footer of the magazine must be placed above or below the advertisement.
3. The advertisement must be no more than a half page in length and use a minimum of 4 colors.
4. There must be at least one paragraph of claims or selling points on the advertisement.
5. Below the advertisement, use at least 3 paragraphs to explain why the magazine was selected, how the artwork gets across the concept or equation use and why the claims or selling points help explain the importance or develop the understanding of the concept or equation.

Pet Name

You are the proud owner of a new and unique pet and have honored it with one of the assigned PHYSICS VOCABULARY OR CONCEPTS for a name.

1. What type of animal is the pet?
2. What is the name of the pet?
3. Explain how the name of the pet fits its behavior.
4. Describe ONE trick you will have the pet learn to represent and show off its name.
5. Make a drawing of the Pet showing off the trick representing its name (minimum of four colors).
6. Describe, using at least 2 paragraphs, how the drawing and trick represents the CONCEPT.

Trip to the Circus

Binky the Clown gives advice about a Science Concept using specific Vocabulary terms in relation to an act or circus attraction.

- A diagram using at least four colors must show Blinky the Clown or an assistant demonstrating the concept must be drawn.
- A three to five sentence explanation by Blinky the Clown written so a fourth grader could understand the Science

Concept and using the Vocabulary terms (high light the terms) must be written.

- A four to six sentence explanation of how the diagram and the explanation showing an understanding at a high school level must be written.

Letter to the Editor

1. The letter must be from 2 to 4 paragraphs in length.
2. The letter must contain the assigned topic or vocabulary terms.
3. Each use of the assigned topic or vocabulary terms must be HIGHLIGHTED.
4. YOU must state an opinion about the topic.
5. At least 5 specific facts must be used to support the opinion.
6. An illustration of the topic must be made after the letter.
7. A minimum of 4 colors (black and white do not count) must be used to make the illustration.
8. A 3 to 5 sentence explanation of how the letter and illustration are related to the topic must be written.

Vehicle Name

As part of design team for a new model vehicle, you must select a name for the model. The name must reflect the vehicle's abilities and one of the assigned PHYSICS CONCEPTS

1. What is the model name of the vehicle?
2. Explain how the model name of the vehicle fits its abilities.
3. Write the advertising slogan to be used to represent and show the vehicle.
4. Create a magazine advertisement (minimum 4 colors) showing the vehicle and emphasizing its abilities and name.
5. Explain in at least 2 paragraphs how the slogan and magazine advertisement represent the PHYSICS CONCEPT.

Band Buzz

Design a four-color minimum Logo for a Band named after the assigned Physics Concept List at least THREE song titles representing assigned Physics Concept and the specific Vocabulary Terms relating to the unit A 5 to 7 sentence explanation of how the logo relates to the concept must be Written. A 5 to 7 sentence explanation of how the song titles relate to the the concept and vocabulary terms must be written.