

### Levels of Questioning

#### 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** shown with numbers and units

**Solution** circled and identified

### Vocabulary Card Instructions

The purpose of a vocabulary card is to assist students in learning and understanding terms, phrases or concepts covered in class and necessary for understanding. Made on 1/16 of a sheet of paper or 1/2 of a 3x5 card. The cartoon or diagram side is taped facing up. Use the vocabulary cards to review information by looking at the diagram and making the connection between the diagrams or pictures and the term. Even better, exchange notebooks with another student and use their vocabulary cards to see if you UNDERSTAND the term and your partner's logic in explaining.

#### *Front Side - has a cartoon or diagram*

1. The diagram or cartoon must have at least 4 different colors (other than black and white).
2. There should be a minimum of writing and explanations on this side of the vocabulary card.

#### *Back Side - Explaining the Words*

1. Word (spelled correctly)
2. Link - a word useful in remembering the word, the meaning should be known; often related or rhyming with the vocabulary word
3. Definition - meaning of word using terms the student understands (1 of the 3 sentences)
4. Usage Sentences - the 2 other sentences helping delineate the meaning of the vocabulary word. These should be student generated.

### Riddle Cards

The purpose of a RIDDLE CARD is to assist students in learning and understanding terms, phrases or concepts covered in class and necessary for understanding. The riddle is placed on the front of a card. The riddle side is taped facing up. The answer and explanation are placed on the back of the card. The card is then taped onto OUT section of the notebook.

#### **Front Side**

1. The FRONT of the RIDDLE CARD has the riddle and artwork written on in.
2. The riddle should contain one or more clues. The clues might or might not rhyme, but must refer to aspects of the answer.
3. The riddle card MUST have artwork on front of the card. The artwork should reflect the topic of the riddle with a clue that MIGHT help solve the riddle.
4. The artwork must be in color. At least 4 different colors (besides black or white must be used).

#### **Back Side**

1. The back of the card has the answer to the riddle.
2. The answer must be clearly and cleanly written across the top of the card.
3. Below the answer an explanation of HOW the clues and artwork lead to the answer must be given.
4. An explanation is usually 2 to 3 sentences in length.

### Question Cards

Question Cards are written to reflect and review information. The QUESTION is placed on the front of the card. A SUMMARIZED ANSWER is placed on the back of the card.

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

### Fables

A fable is a short story with a moral or point to the story.

1. The short story is generally 2 to 3 paragraphs in length.
2. The key concept or vocabulary assigned in class must be used in the fable.
3. The key concept or vocabulary terms must be **HIGHLIGHTED** in the fable.
4. The moral or point to the story is added **AFTER** the last paragraph.
5. After the moral or point to the story is stated, there must be an illustration showing the key concept.
6. After the illustration there must be an explanation of how the story, moral/point and illustration shows the assigned science concept or principle.

### 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 Science topic or concept assigned must be addressed in the limerick
5. An illustration about the topic must follow the limerick.
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

### Cinquains

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**

The first line consists of two syllables / 1 word (the title).

The second line consists of four syllables / 2 words (describes the title).

The third line consists of six syllables / 3 words (states an action).

The fourth line consists of eight syllables / 4 words (expresses a feeling)

The last line consists of two syllables / 1 word (another word for the title).

1. The Cinquain must be written on the assigned topic..
2. Follow the format of syllables and words per line.
3. An illustration of the concept or topic must be made after the cinquain.
4. A minimum of 4 colors (black and white do not count) must be used in the illustration.
5. A 3 to 5 sentence EXPLANATION of how the cinquain and illustration relate to the assigned topic must be made.

#### Haiku Assignment

Haiku is a minimalist, contemplative poetry from Japan that emphasizes nature, color, season, contrasts and surprises. Usually it 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 concept.

**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.
3. There must be a short 3 to 5 sentence explanation telling how the Haiku shows an understanding of the assigned topic.

### 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.

### Rhyming Poem -

The poem must use the assigned vocabulary terms or concepts. There must be a title reflecting the major concept of the poem. There must be at least 5 couplets (two lines rhyming with each other) in the poem. At least 5 terms from the vocabulary list above must be used. The terms must be highlighted.

There must be a diagram with at least one vehicle, one animal and one vegetable and using four colors.

There must be at least 2 paragraphs explaining how the poem and diagram demonstrate the assigned topic.

### 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 SCIENCE 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 showing the vehicle and emphasizing its abilities and name.
5. Explain in at least 2 paragraphs how the slogan and magazine advertisement represent the SCIENCE CONCEPT.

### Equation Bookmark

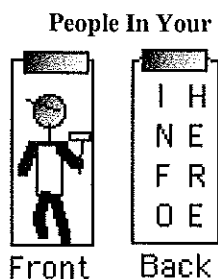
1. Must be no more than 5 cm wide and 20 cm long.
2. Front must have a picture or illustration representing the main concept of the chapter (minimum of 4 colors)
3. Front must have the assigned equation
4. Back must have the assigned equation
5. Back must describe each variable in the equation
6. Back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

### 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.

### Concept Mapping

- When making a Concept Map the main theme or concept is the center bubble of the concept map.
  - Branching off the center bubble are related concepts or topics.
1. Use at least 4 different colors and 4 different shapes on the concept map.
  2. Each color must represent a different thread of ideas or concepts. If a bubble is related to more than one thread of concepts, use all the colors to show this.
  3. Each shape of bubble must represent a different thread of ideas or concepts.
  4. *Include a key identifying what each shape and color represents*
  5. *An explanation must be written next to the line connecting each set of bubbles.*
  6. *The explanation must explain how or why the set of bubbles are related.*



### People In Your Neighborhood Flip It

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.

### Box of Colors

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

1. Four basic colors must be used: Blue, Red, Green and Yellow
2. At least two extra 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 SCIENCE. A warning label must be included across the bottom of the box.

### Newspaper article

Write a 2 to 3 paragraph long newspaper article suitable for the school newspaper about the assigned SCIENCE CONCEPT or TOPIC.

1. The article must contain the H5W (How, Who, What, When, Where, Why) about the concept or equation.
2. The article must have at least two interesting facts people could use in common day conversations.
3. There must be a graphic or illustration (minimum of 4 colors) representing the concept or equation being applied.
4. There must be a caption of 2 to 3 sentences explaining the graphic.

### 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 the 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 explaining how the artwork represents the equation and the best location of the tattoo on the body must be written underneath the tattoo.

### Clothing Line

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

1. Describe one item from the clothing line and how it represents the SCIENCE CONCEPT.
2. Make an illustration (minimum of 4 colors) of the article of clothing with the logo advertising the SCIENCE 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 SCIENCE CONCEPT and how wearing the clothing would help a student learn the science behind the concept.

### Toy Design

Apply your knowledge of fun and SCIENCE to design the hottest and best selling toy of the season. The toy must apply one of the assigned SCIENCE 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 SCIENCE 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 SCIENCE?
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 SCIENCE CONCEPT.

### **Public Service Announcement (PSA)**

You are charged with writing a radio public service announcement 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. Write a 2 to 3 paragraph long explanation of how and why the PSA would influence people to better understand the main CONCEPT.

### **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 SCIENCE idea across must be written.

### **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.
3. Each vocabulary term or phrase must be high lighted.
4. 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.
5. An illustration showing a printed advertisement to accompany the radio campaign must be drawn (use at least 4 colors).
6. An explanation of how both the radio commercial and the printed advertisement meet the key points of the assignment must be written. Write at least one paragraph about each type of advertisement.

### **Song or Rap**

1. The song must use the assigned vocabulary or concepts
2. Use a song or tune familiar to you (Once you have a clear understanding of the concept you have to convey, try to use a song you're already familiar with such as "Bingo," "Row, Row, Row Your Boat" or even a nursery rhyme.
3. Change the lyrics of the original song to demonstrate the concept and use the vocabulary. Remember: when presenting the song, be prepared to sing/play it out loud
4. There must be an illustration (4 color minimum) showing an understanding of the assigned topic and concepts.
5. 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.

### **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 SCIENCE VOCABULARY OR CONCEPTS for a name.

1. What is the name of the pet?
2. Explain how the name of the pet fits its behavior.
3. Describe ONE trick you will have the pet learn to represent and show off its name.
4. Make a drawing of the Pet showing off the trick representing its name.
5. Describe how the drawing and trick represents the CONCEPT.

### Free Fall Sporting Event

Design a non-injurious sporting event, Newtonia that requires a team of players to work together to win.

The sporting event will take place in free fall (no apparent gravity) inside a large air filled bubble.

Players are NOT allowed to use any electrical devices or electronic enhancements.

The sporting event must apply at least 5 different SCIENCE concepts or principles during play.

1. Write the rule or rules to win.
2. Describe and illustrate the uniform or equipment needed to play.
3. Write each of the SCIENCE concepts or principles to be applied during the game and describe how applying each will help a team win the game.
4. Describe any special problems that would have to be solved due to the game being played in free fall (no apparent gravity)

### Hero Special Assignment

Design a comic book hero or heroine. The costume must reflect the name. The name of the hero or heroine must reflect one of the major concepts of the unit. The superpower or strength of the hero or heroine must be related to the major concept of the unit.

1. A single frame cartoon (minimum of four colors) showing the hero or heroine doing an impressive feat must be drawn.
2. There must at least one paragraph explaining how the costume and superpower is related to the major concept of the unit.
3. There must be at one paragraph explaining how the impressive feat in the cartoon demonstrates the application of the major concept of the unit.

### Band Buzz

Design a four-color minimum Logo for a Band named after the assigned Science Concept

List at least THREE song titles representing assigned Science 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.

### Don't Break The Bank



- At \$.10 a word, you have a SET DOLLAR AMOUNT (stated in the homework) to spend on a message to explain the Assigned Concept.
- A four color graphic must show the key points of the Assigned Concept.
- A 3 – 5 sentence explain of how the graphic and message are related to the Assigned Concept.

### Graphs and DRY MIX

**Dependent variable**

Relies upon manipulated

**Y-axis**

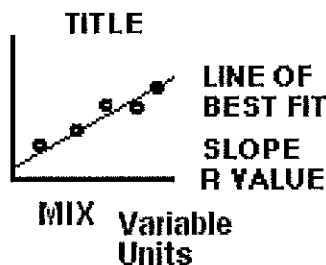
**Manipulated variable**

**Independent**

**X-axis**

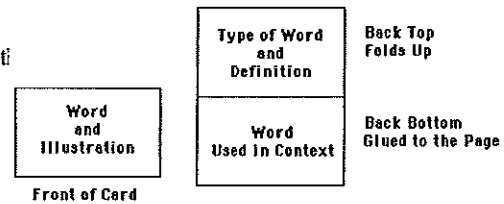
**Power Point Lab Reports**

**DRY**  
Variable  
Units



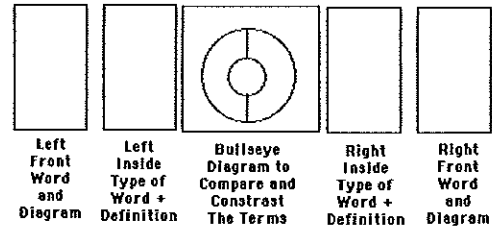
### Fold It 1 – Explain One Term

Fold a piece of paper ONCE  
 Front has the WORD and an ILLUSTRATION representing it  
 Back Top has the type of word (Noun, Verb, etc) and a of the word  
 Back Bottom has the word used in context in a sentence.



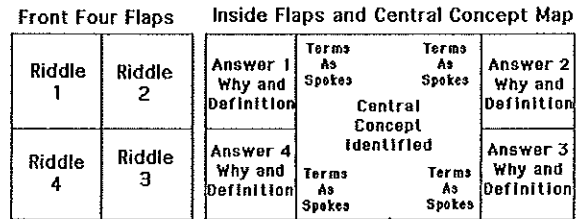
### Fold It 2 – Compare and Contrast Two Terms

Tri-fold a piece of paper  
 Left side – One TERM and an ILLUSTRATION  
 Inside Left Side – Type of word and a definition of the word  
 Right Side – One TERM and an ILLUSTRATION  
 Inside Right Side – Type of word and a definition of the word  
 Inside Center – A bulls eye diagram to compare and contrast the two terms



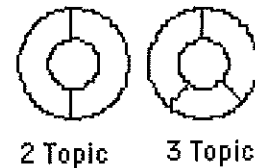
### Fold It 4 – Concept Map

Tri-fold a piece of paper.  
 Cut each flap in two (to form two 'doors')  
 Place a riddle and 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.



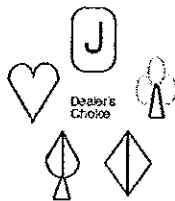
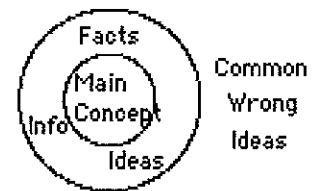
### Bull's Eye Comparison

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 diagram must show how the topics are related.  
 An 3 – 5 sentence Explanation of how the diagram and similarities are related must be written.



### 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. Underneath the Ring of Truth, use at least 2 paragraphs to explain why the wrong incorrect and why people might have these misconceptions.



### Dealer's Choice

*Get to the Heart of the Matter* – Ring of Truth  
*Never Split Diamonds* – Cinquain or Haiku Assignment  
*Dig in With Spades* – Acrostic Poem, Public Service Announcement or a Song/Rap  
*Join the Club* – Fable, Tee Shirt Art, Newspaper Article or Box of Colors  
*Be a Joker* – Any Special Assignment NOT mentioned above AND a Bull's Eye Diagram