Critical Thinking Skills

Force, Motion & Simple Machines

Force – Motion – Simple Machines – All three

Skills For Critical Thinking		Reading Comprehension								Hands-on Activities
		Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7	Section 8	
LEVEL 1 Knowledge	• List Details/Facts	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Recall Information	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Match Vocab. to Definitions	✓	✓	✓	✓	✓	✓	✓		
	• Define Vocabulary	✓	✓	✓	✓	✓	✓	✓		✓
	• Label Diagrams			✓	✓	✓	✓	✓		✓
	• Recognize Validity (T/F)	✓	✓	✓	✓	✓	✓	✓	✓	
LEVEL 2 Comprehension	• Demonstrate Understanding	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Explain Scientific Causation	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Rephrasing Vocab. Meaning	✓	✓	✓	✓	✓	✓	✓		✓
	• Describe	✓	✓	✓	✓	✓	✓	✓		✓
	• Classify into Scientific Groups	✓	✓	✓	✓	✓	✓	✓	✓	✓
LEVEL 3 Application	• Application to Own Life	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Model Scientific Process	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Organize & Classify Facts	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Use Alternative Research Tools									✓
LEVEL 4 Analysis	• Distinguish Roles/Meanings		✓	✓	✓					✓
	• Make Inferences	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Draw Conclusions Based on Facts Provided	✓	✓	✓	✓	✓	✓	✓		✓
	• Classify Based on Facts Researched						✓			✓
LEVEL 5 Synthesis	• Compile Research Information						✓			✓
	• Design & Application			✓	✓	✓				✓
	• Create & Construct	✓	✓		✓	✓		✓		✓
	• Imagine self in Scientific Role				✓					✓
LEVEL 6 Evaluation	• State and Defend an Opinion					✓				✓

Based on Bloom's Taxonomy

NAME: _____

Before You Read

How to Recognize Motion

1. Circle the word True if the statement is true. Circle the word False if it is false.

a) Acceleration means speeding up.

True **False**

b) Something thrown into the air decelerates on the way up.

True **False**

c) To find the speed of something we multiply time by distance.

True **False**

d) The sun moves across the sky.

True **False**

e) Vibration is a kind of motion.

True **False**

2. Put a check mark (✓) next to the answer that is most correct.

a) What is spinning motion called?

- ○ **A** acceleration
- ○ **B** frequency
- ○ **C** rotation
- ○ **D** vibration

b) What kind of motion does any thing have just after it drops from a height?

- ○ **A** acceleration
- ○ **B** deceleration
- ○ **C** steady speed
- ○ **D** change of direction

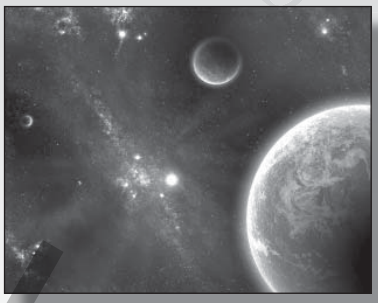
c) How many of these things move in a circle around the Earth?

the sun **the moon** **a star**

- ○ **A** none
- ○ **B** one
- ○ **C** two
- ○ **D** three

NAME: _____

How to Recognize Motion



You can tell when something is moving because you can see it move. Or can you? If ***you*** are moving, you can feel you are moving. Or can you? Motion is trickier than it looks—and more interesting.

To see and measure motion, we must always compare the moving object to some other object or a background. We usually think of big things, like the Earth, as not moving. The sun seems to move across the sky during the day. If we could step outside the solar system, we would see the sun as ***not*** moving and the Earth as spinning. We think the Earth is not moving because we are standing on it.

If you were in a spacecraft lost in space, far from the nearest star, you could not tell if you were moving or staying in the same place. Out there, you would have no object or background to compare your motion to.

1. Name one thing that seems to move across the sky but does not.

_____

2. Name one thing that actually does move across the sky.

_____

We can't ***feel*** motion either. We feel the wind on our face, we feel changes in motion, but we can't feel steady, smooth motion. Suppose you were riding in a car at a steady speed on a perfectly smooth road. If you closed your eyes, you would have no feeling of motion.

Now you are back in the spacecraft. You could tell if the spacecraft suddenly speeded up, slowed down, or changed direction. You could ***not*** tell the difference between standing still and moving at a steady speed in a straight line.

NAME: _____

How to Recognize Motion

1. Circle the word True if the statement is true. Circle the word False if it is false.

a) Earth does not move.

True **False**

b) If something causes us to suddenly accelerate, we can always feel it.

True **False**

c) Things in outer space are in fixed positions.

True **False**

d) We can tell if a car we are riding in is moving by looking out the window.

True **False**

e) We cannot feel steady, smooth motion in a straight line.

True **False**

2. Put a check mark (✓) next to the answer that is most correct.

a) How can we always tell if something is moving?

- ○ **A** by its size
- ○ **B** by the noises it makes
- ○ **C** by seeing it against a background
- ○ **D** by looking closely at it for a long time

b) Which moves across the sky?

- ○ **A** the sun
- ○ **B** the stars
- ○ **C** the planets
- ○ **D** the clouds

c) Why can we feel ourselves falling?

- ○ **A** because we are moving fast
- ○ **B** because we are accelerating
- ○ **C** because we are changing direction
- ○ **D** because we are getting closer to the Earth