

# Rainshadow Science 1B ~ Inquiry

## Mission 1: Operation Infinite Potential

Name \_\_\_\_\_ Date \_\_\_\_\_

Logon to your JASON student account. Click on **Infinite Potential**. Click on **Mission 1~ Critical Current: Defining Energy**.

### Contents

- Read and then click **Next>>**

### Objectives

- Fill in the missing terms or phrases

*Explore \_\_\_\_\_ in its many forms.*

To accomplish your mission successfully, you will need to

- Discover the forms of \_\_\_\_\_ and \_\_\_\_\_ energy.
- Explain the \_\_\_\_\_ and \_\_\_\_\_ of the different energy forms.
- Understand the characteristics and behavior of \_\_\_\_\_.
- Evaluate the \_\_\_\_\_ as a major source of energy in the solar system.
- Survey the \_\_\_\_\_ and electromagnetic \_\_\_\_\_ emitted by the sun.
- Examine how \_\_\_\_\_ interacts with \_\_\_\_\_.
- click **Next>>**

### Mystery Connection

- Read the Mystery Connection about space weather prediction.
- click **Next>>**

### Meet the Team

- This is where you can meet and learn about the **Host Researcher, Student Argonauts, and Teacher Argonauts** who were responsible for putting this mission together.
- Click **Next>>**

### Defining Energy

- As a class, read this page and define the following terms.

Coronal Mass Ejection:

Magnetic Field:

- Watch the **Mission 1 Briefing Video**. Answer the questions that go along with the video.
- Click **Next>>**

## Energy

- Define the term, answer the question, or fill in the missing terms or phrases where appropriate...

Energy:

Work:

Force:

Potential Energy (PE):

Kinetic Energy (KE):

1. In a brief paragraph, explain how a cyclist or snowboarder sitting at the top of a hill could turn her potential energy into kinetic energy.

- Click **Next**>>

## Forms of Potential Energy

- Define the term, answer the question, or fill in the missing terms or phrases where appropriate...

Gravity:

Conservation of Mass:

In your own words, describe the following potential energy concepts...

1. Gravitational -
2. Elastic -
3. Magnetic -
4. Electrostatic -
5. Chemical -
6. Nuclear -

Use the box explaining Gravitational Potential Energy to fill in the box below...

|                                              |       |
|----------------------------------------------|-------|
| <b><i>Gravitational Potential Energy</i></b> |       |
| <b>PE = _ _ _</b>                            |       |
| PE =                                         | _____ |
| m =                                          | _____ |
| g =                                          | _____ |
| h =                                          | _____ |

- Click Next>>

### **Forms of Kinetic Energy**

- Define the term, answer the question, or fill in the missing terms or phrases where appropriate...

Thermal Energy:

Temperature:

Waves:

Electromagnetic Waves:

In your own words, describe the following kinetic energy concepts...

1. Mechanical -

2. Thermal -

3. Electrical -

4. Sound -

5. Electromagnetic -

Use the box explaining Mechanical Kinetic Energy to fill in the box below...

|                                                          |
|----------------------------------------------------------|
| <b>Mechanical Kinetic Energy</b>                         |
| <b>KE = <math>\frac{1}{2}</math> ___ <math>^2</math></b> |
| KE = _____                                               |
| m = _____                                                |
| v = _____                                                |

- Click Next>>

**Forms of Energy**

- Draw a picture that shows each type of potential or kinetic energy in the box provided...

| <b><u>Potential Energy</u></b> | <b><u>Kinetic Energy</u></b> |
|--------------------------------|------------------------------|
| Gravitational                  | Mechanical                   |
| Elastic                        | Thermal                      |
| Chemical                       | Electrical                   |
| Nuclear                        | Sound                        |
| Magnetic                       | Electromagnetic              |
| Electrostatic                  |                              |

- Click Next>>

## Energy, Work, and Power

- Define the term, answer the question, or fill in the missing terms or phrases where appropriate...

Joule:

Work:

Force:

Power:

Use the box explaining Work to fill in the box below...

|                                    |
|------------------------------------|
| <i>Work</i>                        |
| <b>W =</b> <u>    </u> <u>    </u> |
| w = _____                          |
| f = _____                          |
| d = _____                          |

Use the box explaining Power to fill in the box below...

|                        |
|------------------------|
| <i>Power</i>           |
| <b>P =</b> <u>    </u> |
| P = _____              |
| w = _____              |
| t = _____              |

1. In an original short paragraph of your own, explain the difference between **energy**, **work**, and **power**.

- Click Next>>

## Electromagnetic Energy: Visible Light

- Define the term, answer the question, or fill in the missing terms or phrases where appropriate...

Reflecting:

Ray Diagram:

Refract:

Transmit:

Absorb:

Transparent:

Translucent:

Opaque:

Convex Lens:

Concave Lens:

- Use the interactive diagram to explain how light behaves when it encounters the following types of surfaces.

1. Transparent:

2. Translucent:

3. Mirrored:

4. Opaque:

- Click Next>>

### Electromagnetic Energy: Infrared and Ultraviolet

- Define the term, answer the question, or fill in the missing terms or phrases where appropriate...

#### Infrared (IR):

#### Ultraviolet (UV):

- In a short paragraph, explain how you can use refraction to make white light show all of the colors of the rainbow. How and why does this work?

- Click **Next>>**

### Electromagnetic Energy: The Ends of the Spectrum

- Define the term, answer the question, or fill in the missing terms or phrases where appropriate...
- In your own words, explain the following electromagnetic energy forms and what they can be used for.

1. Gamma Rays –

2. X Rays –

3. Microwaves –

4. Radio Waves –

- Click **Next>>**

### The Radiation Budget

- Define the term, answer the question, or fill in the missing terms or phrases where appropriate...

1. Which wavelengths of energy penetrate all the way to the surface of the earth?

- Click **Next>>**

### Energy From the Sun

- Define the term, answer the question, or fill in the missing terms or phrases where appropriate...

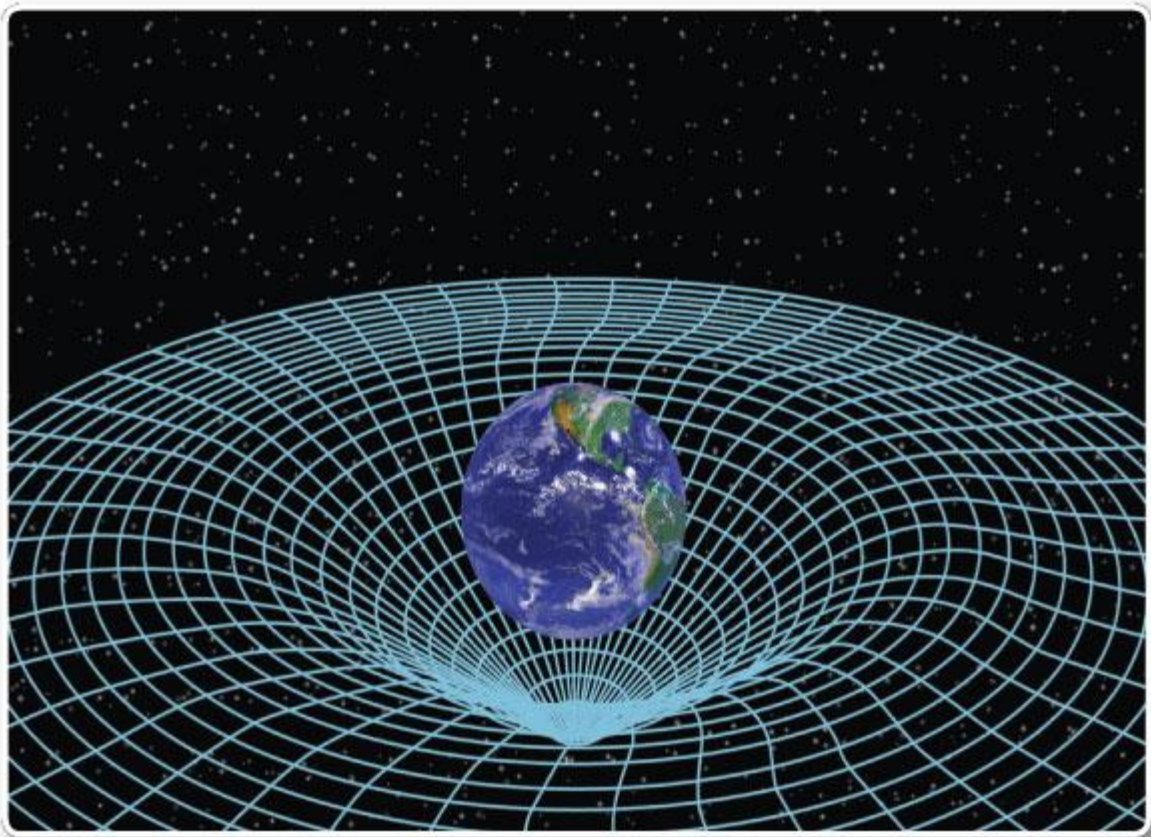
#### Solar Wind:

#### Coronal Mass Ejections:

- Click **Next>>**

## Protecting Earth

- Define the term, answer the question, or fill in the missing terms or phrases where appropriate...
  - 1. In a short paragraph, explain how solar weather can affect **satellites**, **communications**, and **electrical supplies** on earth.
- 
- Click Next>>



## Mission 1 Labs

- Complete the Mission 1 Labs: Energy Survey Lab, Changes in Potential, Exploring Visible Light, and Detecting Ultraviolet Radiation as instructed by your teacher.  
Go on to Mission 2 as instructed by your teacher...