

Critical Thinking Skills

Simple Machines

Skills For Critical Thinking		Reading Comprehension							Hands-on Activities
		Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7	
LEVEL 1 Remembering	<ul style="list-style-type: none"> List Details/Facts Recall Information Match Vocab. to Definitions Define Vocabulary Label Diagrams Recognize Validity (T/F) 	✓	✓	✓	✓	✓	✓	✓	✓
LEVEL 2 Understanding	<ul style="list-style-type: none"> Demonstrate Understanding Explain Scientific Causation Rephrasing Vocab. Meaning Describe Classify into Scientific Groups 	✓	✓	✓	✓	✓	✓	✓	✓
LEVEL 3 Applying	<ul style="list-style-type: none"> Application to Own Life Model Scientific Process Organize & Classify Facts Use Alternative Research Tools 	✓	✓	✓	✓	✓	✓	✓	✓
LEVEL 4 Analysing	<ul style="list-style-type: none"> Distinguish Roles/Meanings Make Inferences Draw Conclusions Based on Facts Provided Classify Based on Facts Researched 	✓		✓	✓	✓	✓	✓	✓
LEVEL 5 Evaluating	<ul style="list-style-type: none"> State & Defend an Opinion 					✓			✓
LEVEL 6 Creating	<ul style="list-style-type: none"> Compile Research Information Design & Application Create & Construct Imagine self in Scientific Role 				✓	✓			✓

Based on Bloom's Taxonomy



What Are Force, Motion, and Work?

Carrying a 50-pound rock around on your shoulder all day sounds like hard **work**. If you think so, you are half right. It would be hard, but it wouldn't be work—at least not the way the word work is used in science.

To understand what work is we first have to understand **force** and **motion**. You may remember that a force is a push or a pull. You can **exert** a force on something by pushing or pulling with your hands. **Gravity** and **friction** are also common forces.

We can see motion, so we already have a feeling for what it is. When something moves from one place to another, that is motion.



When a force acts on something, it sometimes makes the thing move. If the thing moves *in the direction* that the force is acting, *that* is work. Carrying the rock wasn't work because the force on it was pushing up, and the rock was moving sideways.

Lifting the rock onto your shoulder *is* work. The force is the same as the weight of the rock and the direction of motion is up. Throwing a ball is also work because the ball moves in the direction of the force exerted by your hand.



A Pocketful of Simple Machines

This activity is about all the simple machines found in a Swiss Army knife. A picture of this kind of pocketknife is shown below. You can use the picture, but, if you can get a Swiss Army knife to look at, it would be easier.



See how many different SIMPLE MACHINES you can find in a Swiss Army knife. See if you can find any COMPOUND MACHINES. There are many different kinds of these knives, so you will not all get the same answers. Some knives have even more gadgets that pop out than the one shown.

SAMPLE

Levers



First-class lever



Second-class lever



Third-class lever