

## Summative 1: Systems in Action

Overall Expectation(s): 3. Demonstrate an understanding of different types of systems and the factors that contribute to their safe and efficient operation. (8s20).

Your Goal: Demonstrate an understanding of the following topics:

### Systems

- Identify various types of systems (e.g., mechanical systems, body systems, optical systems, mass transit systems, Aboriginal clan systems, health care systems) (8s30).
- Identify the purpose, inputs, and outputs of various systems (8s31)
- Identify the various processes and components of a system that allow it to perform its function efficiently and safely (8s32)

### Safe and Efficient Operation

- Compare, using examples, the scientific definition with the everyday use of the terms work, force, energy, & efficiency (8s33)
- Understand and use the formula  $\text{work} = \text{force} \times \text{distance}$  to establish the relationship between work, force, and distance moved parallel to the force in simple systems (8s34)
- Calculate the mechanical advantage of various mechanical systems (8s35) (Create an example)
- Explain ways in which mechanical systems produce heat, and describe ways to make these systems more efficient (8s36)
- Describe systems that have improved the productivity of various industries (8s37)
- Identify social factors that influence the evolution of a system (8s38)

Consider the following vocabulary:

- |   |  |   |  |
|---|--|---|--|
| <input type="checkbox"/> action-at-a-distance           | <input type="checkbox"/> machine   | <input type="checkbox"/> fulcrum            | <input type="checkbox"/> wheel and axle          |
| <input type="checkbox"/> contact force                  | <input type="checkbox"/> mass  | <input type="checkbox"/> inclined plane     | <input type="checkbox"/> automated system        |
| <input type="checkbox"/> energy                         | <input type="checkbox"/> output force  | <input type="checkbox"/> lever              | <input type="checkbox"/> components              |
| <input type="checkbox"/> force                          | <input type="checkbox"/> potential energy  | <input type="checkbox"/> mechanical system  | <input type="checkbox"/> consumer                |
| <input type="checkbox"/> friction                       | <input type="checkbox"/> mechanical advantage  | <input type="checkbox"/> mechanism          | <input type="checkbox"/> criteria                |
| <input type="checkbox"/> gravitational potential energy | <input type="checkbox"/> spring scale  | <input type="checkbox"/> pulley             | <input type="checkbox"/> non-mechanical system   |
| <input type="checkbox"/> gravity                        | <input type="checkbox"/> weight  | <input type="checkbox"/> screw              | <input type="checkbox"/> productivity            |
| <input type="checkbox"/> ideal mechanical advantage     | <input type="checkbox"/> work  | <input type="checkbox"/> simple machine     | <input type="checkbox"/> qualitative assessment  |
| <input type="checkbox"/> input force                    | <input type="checkbox"/> efficiency  | <input type="checkbox"/> useful output work | <input type="checkbox"/> quantitative assessment |
| <input type="checkbox"/> kinetic energy                 | <input type="checkbox"/> 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> class lever | <input type="checkbox"/> wedge              |  |

### Option 1: Systems in Action Mind Map

Mind maps are used to generate, visualize, structure, and classify ideas, and as an aid in study, organization, problem solving, decision making, and writing. A mind map is a diagram used to represent words, ideas, tasks, or other items linked to and arranged around a central key word or idea. Start your graphic organizer with the words “Systems in Action” in the middle. Use a pencil so you can make changes as you learn more information. Add to your graphic organizer with pictures and science vocabulary as you read through the chapter.

### Option 2: Systems in Action Key Concept Review

The following questions provide a review of structures and forces and can be found in your Investigating Science and Technology textbook. Answer the questions in your Science notebook.

- Page 105 #1, 2, 3, 5, 8     Page 112 #1, 2, 3, 6, 7, 8     Page 124 #9, 11, 17     Page 152 #2, 12

### Option 3: Systems in Action Review

Using any of the following imaginative ideas, create a review of the systems in action and forces concepts.

Make sure to include pictures and science vocabulary. Some ideas to consider for your graphic organizer:

- |   |  |  |  |                                     |
|---|--|--|--|-------------------------------------|
| <input type="checkbox"/> advertisement  | <input type="checkbox"/> cheer                         | <input type="checkbox"/> diary                   | <input type="checkbox"/> label         | <input type="checkbox"/> resume     |
| <input type="checkbox"/> advice column  | <input type="checkbox"/> comic Strip                   | <input type="checkbox"/> fable                   | <input type="checkbox"/> letter        | <input type="checkbox"/> riddle     |
| <input type="checkbox"/> announcement   | <input type="checkbox"/> commercial                    | <input type="checkbox"/> fake Journalism article | <input type="checkbox"/> limerick      | <input type="checkbox"/> song text  |
| <input type="checkbox"/> apology letter | <input type="checkbox"/> complaint letter              | <input type="checkbox"/> haiku                   | <input type="checkbox"/> menu          | <input type="checkbox"/> speech     |
| <input type="checkbox"/> autobiography  | <input type="checkbox"/> create a 3-D drawing          | <input type="checkbox"/> horoscope               | <input type="checkbox"/> movie review  | <input type="checkbox"/> spell      |
| <input type="checkbox"/> bibliography   | <input type="checkbox"/> create a postcard or brochure | <input type="checkbox"/> instructions            | <input type="checkbox"/> myth          | <input type="checkbox"/> story      |
| <input type="checkbox"/> bylaw          | <input type="checkbox"/> description                   | <input type="checkbox"/> interview               | <input type="checkbox"/> newspaper     | <input type="checkbox"/> storyboard |
| <input type="checkbox"/> card or letter | <input type="checkbox"/> design a flag                 | <input type="checkbox"/> invitation              | <input type="checkbox"/> nursery Rhyme | <input type="checkbox"/> survey     |
| <input type="checkbox"/> cartoon        | <input type="checkbox"/> dialogue                      | <input type="checkbox"/> journal entry           | <input type="checkbox"/> rap           |                                     |

FULL Name: \_\_\_\_\_

DUE Date: \_\_\_\_\_

### Assessment Criteria - Summative Evaluation

	Level 4	Level 3	Level 2	Level 1
<p>Systems</p> <ul style="list-style-type: none"> <li>•Identify various types of systems (8s30)</li> <li>•Identify the purpose, inputs, &amp; outputs of various systems (8s31)</li> <li>•Identify the various processes and components of a system that allow it to perform its function efficiently and safely (8s32)</li> </ul>	<p>Student demonstrates a high degree of understanding of different types of systems.</p>	<p>Student demonstrates considerable understanding of different types of systems.</p>	<p>Student demonstrates some understanding of different types of systems.</p>	<p>Student demonstrates limited understanding of different types of systems.</p>
<p>Safe and Efficient Operation</p> <ul style="list-style-type: none"> <li>•Compare, using examples, the scientific definition with the everyday use of the terms work, force, energy, &amp; efficiency (8s33)</li> <li>•Understand and use the formula <math>work = force \times distance</math> to establish the relationship between work, force, and distance moved parallel to the force in simple systems (8s34)</li> <li>•Calculate the mechanical advantage of various mechanical systems (8s35)</li> <li>•Explain ways in which mechanical systems produce heat, and describe ways to make these systems more efficient (8s36)</li> <li>•Describe systems that have improved the productivity of various industries (8s37)</li> <li>•Identify social factors that influence the evolution of a system (8s38)</li> </ul>	<p>Student demonstrates a high degree of understanding of factors that contribute to the safe and efficient operation of systems.</p>	<p>Student demonstrates considerable understanding of factors that contribute to the safe and efficient operation of systems.</p>	<p>Student demonstrates some understanding of factors that contribute to the safe and efficient operation of systems.</p>	<p>Student demonstrates limited understanding of factors that contribute to the safe and efficient operation of systems.</p>
	<p>Student demonstrates a high degree of understanding of different types of systems and the factors that contribute to their safe and efficient operation.</p>	<p>Student demonstrates considerable understanding of different types of systems and the factors that contribute to their safe and efficient operation.</p>	<p>Student demonstrates some understanding of different types of systems and the factors that contribute to their safe and efficient operation.</p>	<p>Student demonstrates limited understanding of different types of systems and the factors that contribute to their safe and efficient operation.</p>