FULL Name: _____ DUE Date: _____

Summative 1: Structural Forms and Forces

Overall Expectation(s): 3. Demonstrate an understanding of the relationship between structural forms and the forces that act on and within them (7s22).

Your Goal: Demonstrate an understanding of the following topics:

Structures

- ☐ Classify structures as solid structures, frame structures, or shell structures (7s32).
- ☐ Describe ways in which the centre of gravity of a structure affects the structure's stability (7s33) and describe the role of symmetry in structures (e.g., aesthetic appeal, structural stability) (7s36)
- ☐ Identify the factors (e.g., properties of the material as they relate to the product, availability, costs of shipping, aesthetic appeal, disposal) that determine the suitability of materials for use in manufacturing a product (e.g., a running shoe) (7s38)

Forces

- ☐ Distinguish between external forces (e.g., wind, gravity, earthquakes) and internal forces (tension, compression, shear, and torsion) acting on a structure (7s35)
- ☐ Identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure (7s34)
- ☐ Identify and describe factors that can cause a structure to fail (e.g., bad design, faulty construction, foundation failure, extraordinary loads) (7s37)

Consider the following vocabulary:

☐ force	☐ internal force	☐ tension	☐ ergonomics	☐ structural components
☐ form	☐ load	☐ torsion	☐ failure	structural failure
☐ function	☐ plane of application	☐ arch	☐ fatigue	☐ structural fatigue
☐ structure	☐ point of application	☐ beam	☐ girder	☐ structural stress
☐ combination structure	☐ sensor	☐ box beam	☐ I-beam	☐ symmetry
☐ compression	☐ shear	☐ cantilever	☐ product recall	☐ consumer
☐ dynamic load	☐ shell structure	☐ centre of gravity	☐ prototype	☐ lifespan
☐ external force	☐ solid structure	☐ column	☐ stability	☐ manufacturer
☐ frame structure	☐ static load	☐ corrugated cardboard	☐ stress	☐ market research
☐ gravity	☐ strength	☐ corrugated metal		☐ planned obsolescence

Option 1: Structures and Forces 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 "Structures and Forces" 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: Structure and Forces 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 107 #1, 2, 3 ☐ Page 115 #1, 2, 3, 4 ☐ Page 122 #1, 5 ☐ Page 148 #1, 2, 3, 7, 12

Option 3: Structure and Forces Review

Using any of the following imaginative ideas, create a review of the structures and forces concepts. Make sure to include pictures and science vocabulary. Some ideas to consider for your graphic organizer:

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

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Assessment Criteria - Summative Evaluation

	Level 4	Level 3	Level 2	Level 1
Structures •Classify structures as solid structures, frame structures, or shell structures (7s32). •Describe ways in which the centre of gravity of a structure affects the structure's stability (7s33) and describe the role of symmetry in structures (e.g., aesthetic appeal, structural stability) (7s36) •Identify the factors (e.g., properties of the material as they relate to the product, availability, costs of shipping, aesthetic appeal, disposal) that determine the suitability of materials for use in manufacturing a product (e.g., a running shoe) (7s38)	Student demonstrates a high degree of understanding of structural forms.	Student demonstrates considerable understanding of structural forms.	Student demonstrates some understanding of structural forms.	Student demonstrates limited understanding of structural forms.
Forces •Distinguish between external forces (e.g., wind, gravity, earthquakes) and internal forces (tension, compression, shear, and torsion) acting on a structure (7s35) •Identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure (7s34) •Identify and describe factors that can cause a structure to fail (e.g., bad design, faulty construction, foundation failure, extraordinary loads) (7s37)	Student demonstrates a high degree of understanding of forces that act on and within structures.	Student demonstrates considerable understanding of forces that act on and within structures.	Student demonstrates some understanding of forces that act on and within structures.	Student demonstrates limited understanding of forces that act on and within structures.
	Student demonstrates a high degree of understanding of the relationship between structural forms and the forces that act on and within them.	Student demonstrates considerable understanding of the relationship between structural forms and the forces that act on and within them.	Student demonstrates some understanding of the relationship between structural forms and the forces that act on and within them.	Student demonstrates limited understanding of the relationship between structural forms and the forces that act on and within them.