Coherence and Alignment Among Science Curriculum, Instruction, and Assessment (CASCIA) Project

Grade 8 Unit 4: Providing Solutions to Problems Using Simple Wave Properties

Task 2 Prompt 2 Part B Scored and Annotated Anchor Set

May 2025

Grade 8 Unit 4: Providing Solutions to Problems Using Simple Wave Properties, Task 2 Prompt 2 Part B Scored and Annotated Anchor Set was developed with funding from the U.S. Department of Education under the Competitive Grants for State Assessments Program CFDA 84.368A. The contents of this paper do not represent the policy of the U.S. Department of Education, and no assumption of endorsement by the Federal government should be made.

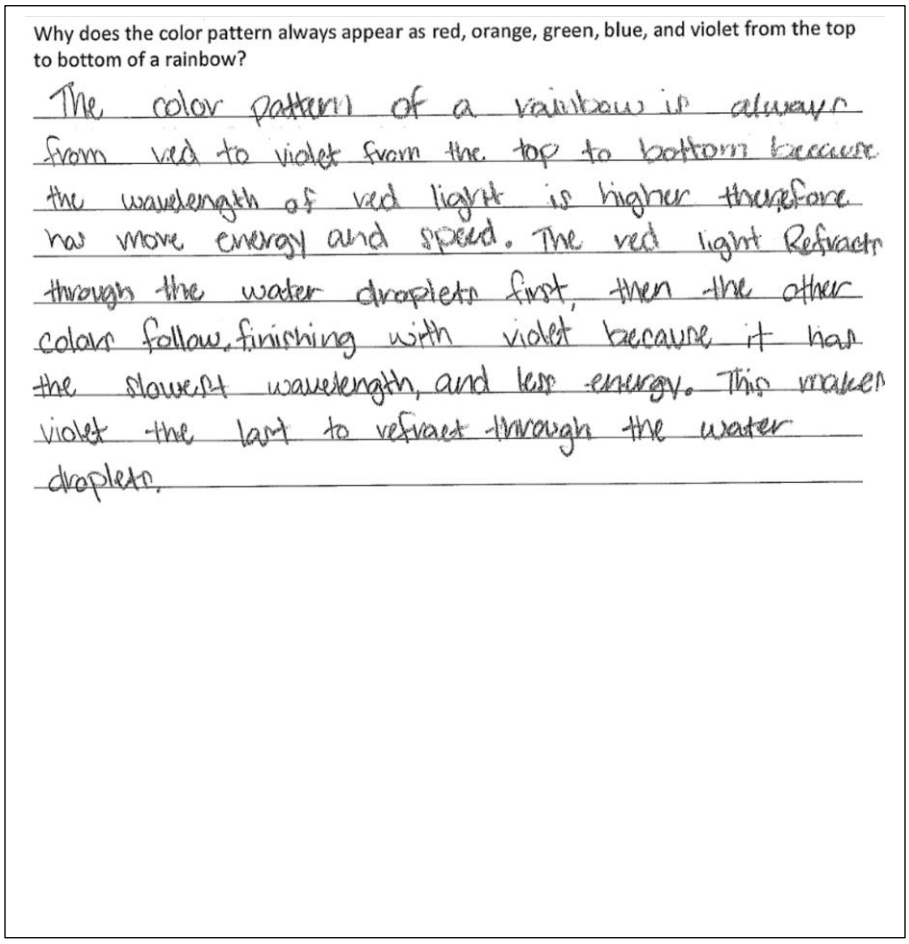
CASCIA Grade 8 EOU Assessment 4 Task 2: Color My World
Prompt 2 Part B Score Point 3
Prompt 2 Part B Rubric

Prompt	Score Point 0	Score Point 1	Score Point 2	Score Point 3	Score Point 4
Prompt 2 Part B.	No aspect of the response is correct	Response includes **one (1)** of the **three (3)** aspects	Response includes **two (2)** of the **three (3)** aspects	Response includes the following aspects: • Identifies that the speed of light decreases when passing from air to water (i.e., raindrop) • Describes the relationship between speed and wavelength of light • Applies that relationship to the angle of refraction to support the explanation of the ROYGBV sequence of the colors of a rainbow	NA

Score Point 3 (3/3 aspects met)

- Part B
  - Identifies that the speed of light decreases when passing from air to water (i.e., ". . . refract through the water droplets . . .").
  - Describes the relationship between speed and wavelength of light.
  - Applies that relationship to the angle of refraction to support the explanation of the ROYGBV sequence of colors of the rainbow.

NOTE: As refraction is the change in direction of a wave passing from one medium to another caused by its change in speed, the appropriate use of the term satisfies bullet one.


Why does the color pattern always appear as red, orange, green, blue, and violet from the top to bottom of a rainbow?

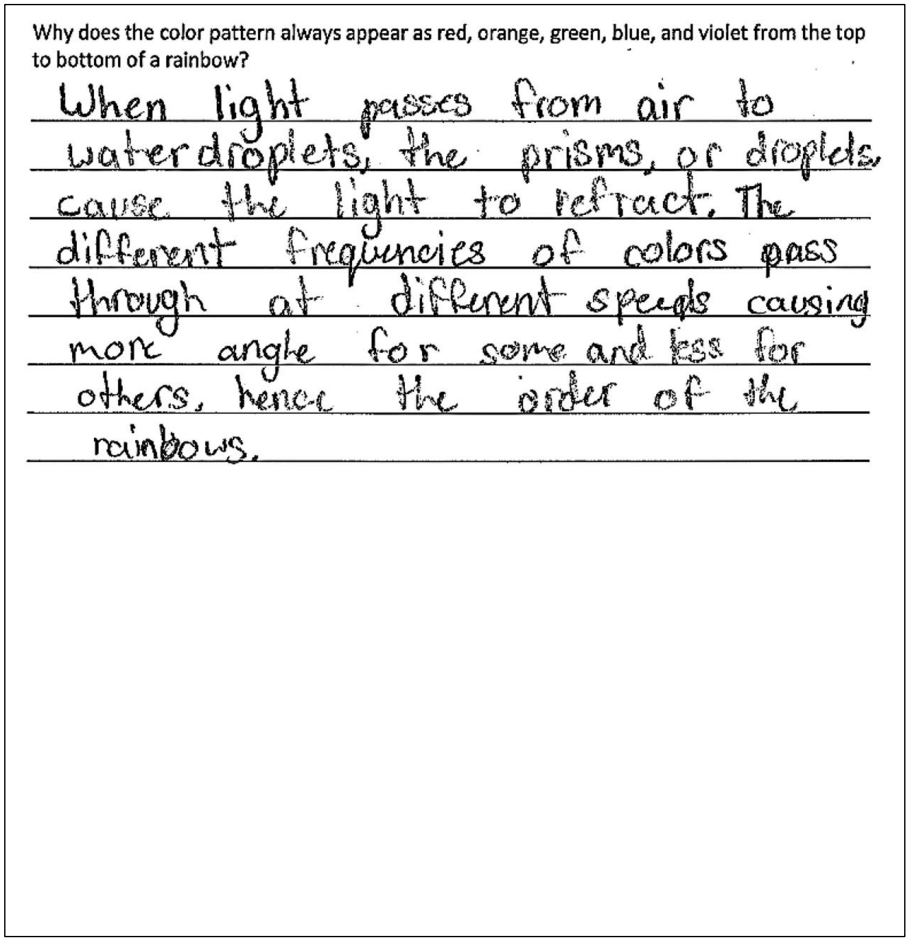
The color pattern of a rainbow is always from red to violet from the top to bottom because the wavelength of red light is higher therefore has more energy and speed. The red light Refracts through the water droplets first, then the other colors follow, finishing with violet because it has the slowest wavelength, and less energy. This makes violet the last to refract through the water droplets.

CASCIA Grade 8 EOU Assessment 4 Task 2: Color My World
Prompt 2 Part B Score Point 2
Prompt 2 Part B Rubric

Prompt	Score Point 0	Score Point 1	Score Point 2	Score Point 3	Score Point 4
Prompt 2 Part B.	No aspect of the response is correct	Response includes **one (1)** of the **three (3)** aspects	Response includes **two (2)** of the **three (3)** aspects	Response includes the following aspects: • Identifies that the speed of light decreases when passing from air to water (i.e., raindrop) • Describes the relationship between speed and wavelength of light • Applies that relationship to the angle of refraction to support the explanation of the ROYGBV sequence of the colors of a rainbow	NA

Score Point 2 (2/3 aspects met)

- Part B
  - Identifies that the speed of light decreases when passing from air to water (i.e., ". . . light passes from air to water . . . cause the light to refract").
  - Does **NOT** describe the relationship between speed and wavelength of light (i.e., the student relates frequencies and speed).
  - Applies that relationship to the angle of refraction to support the explanation of the ROYGBV sequence of colors of the rainbow (i.e., relates speed of the colors, which depends on wavelength, to refraction.)


Why does the color pattern always appear as red, orange, green, blue, and violet from the top to bottom of a rainbow?

When light passes from air to water droplets, the prisms, or droplets, cause the light to refract. The different frequencies of colors pass through at different speeds causing more angle for some and less for others, hence the order of the rainbows.

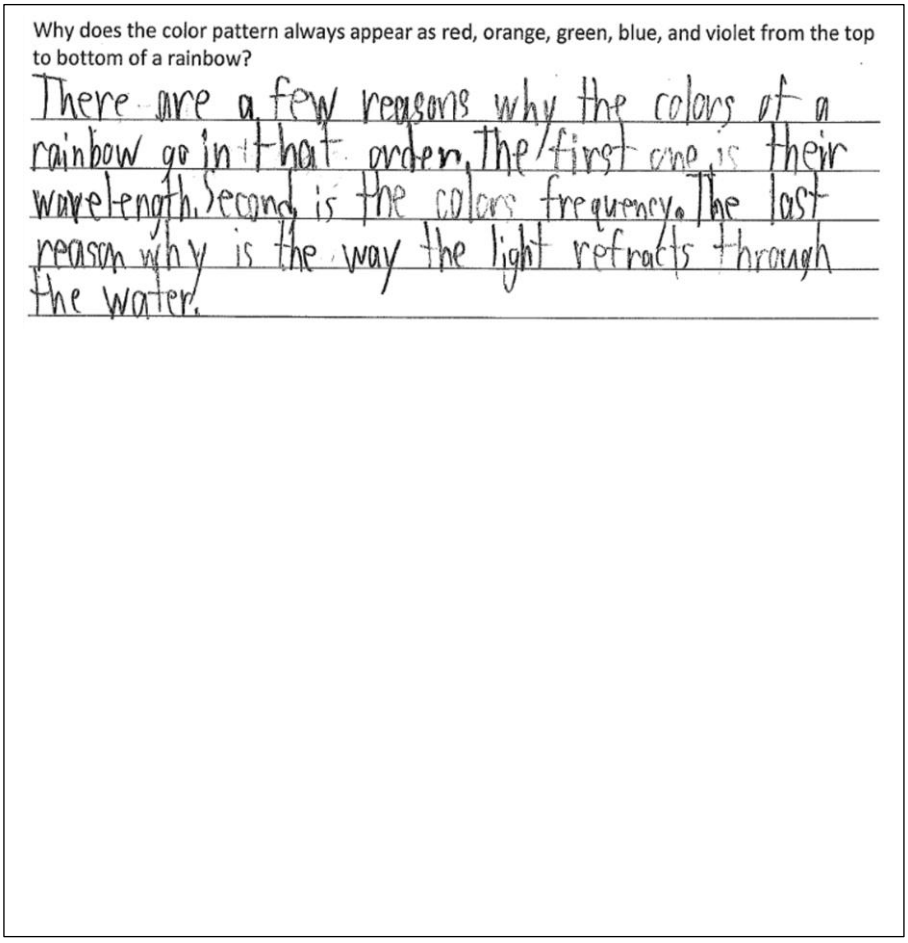
CASCIA Grade 8 EOU Assessment 4 Task 2: Color My World
Prompt 2 Part B Score Point 1

Prompt 2 Part B Rubric

Prompt	Score Point 0	Score Point 1	Score Point 2	Score Point 3	Score Point 4
Prompt 2 Part B.	No aspect of the response is correct	Response includes **one (1)** of the **three (3)** aspects	Response includes **two (2)** of the **three (3)** aspects	Response includes the following aspects: • Identifies that the speed of light decreases when passing from air to water (i.e., raindrop) • Describes the relationship between speed and wavelength of light • Applies that relationship to the angle of refraction to support the explanation of the ROYGBV sequence of the colors of a rainbow	NA

Score Point 1 (1/3 aspects met)

- Part B
  - Does **NOT** identify that the speed of light decreases when passing from air to water (i.e., raindrop).
  - Does **NOT** describe the relationship between speed and wavelength of light.
  - Applies that relationship to the angle of refraction to support the explanation of the ROYGBV sequence of colors of the rainbow (i.e., student response describes a relationship among speed, wavelength, and refraction to explain the order of the colors).


Why does the color pattern always appear as red, orange, green, blue, and violet from the top to bottom of a rainbow?

There are a few reasons why the colors of a rainbow go in that order. The first one is their wavelength. Second is the colors frequency. The last reason why is the way the light refracts through the water.

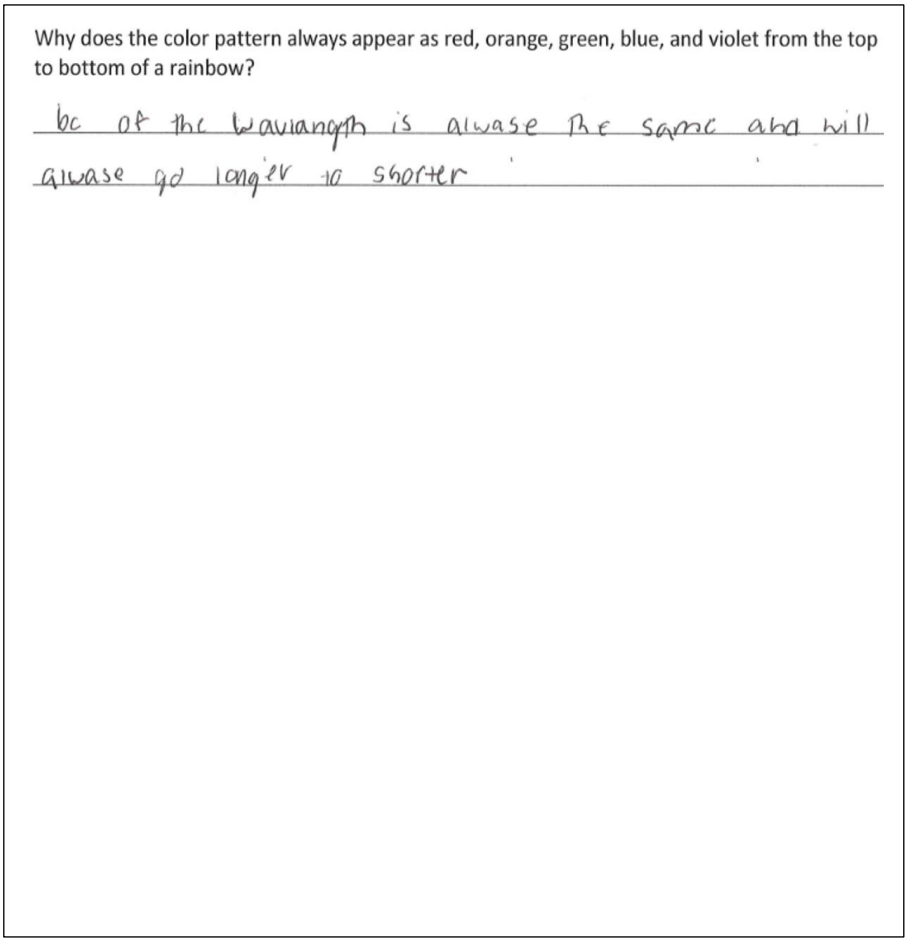
CASCIA Grade 8 EOU Assessment 4 Task 2: Color My World
Prompt 2 Part B Score Point 0

Prompt 2 Part B Rubric

Prompt	Score Point 0	Score Point 1	Score Point 2	Score Point 3	Score Point 4
Prompt 2 Part B.	No aspect of the response is correct	Response includes **one (1)** of the **three (3)** aspects	Response includes **two (2)** of the **three (3)** aspects	Response includes the following aspects: • Identifies that the speed of light decreases when passing from air to water (i.e., raindrop) • Describes the relationship between speed and wavelength of light • Applies that relationship to the angle of refraction to support the explanation of the ROYGBV sequence of the colors of a rainbow	NA

Score Point 0 (0/3 aspects met)

- Part B
  - Does **NOT** identify that the speed of light decreases when passing from air to water.
  - Does **NOT** describe the relationship between speed and wavelength of light.
  - Does **NOT** apply that relationship to the angle of refraction to support the explanation of the ROYGBV sequence of colors of the rainbow (i.e., the student states that the colors are in the order of the wavelengths but does not relate this to refraction).


Why does the color pattern always appear as red, orange, green, blue, and violet from the top to bottom of a rainbow?

bc of the wavlength is alwase the same and will alwase go longer to shorter