Features Analysis Chart—Variation in Traits

Teacher Name: _____ **Circle One:** PRE POST

Describe the assessment item: Questions 1–4 on the pre-post assessment for the Variation in Traits unit:

1. Circle all of the traits. (a) The number of spots on a dog; (b) the clothes a person is wearing; (c) the six legs on a ladybug; (d) the length of a sunflower's stem.

2. Look at the picture of a plant. (a) What are three traits of the plant? (b) Now think about 10 more plants of the same kind. What three trait variations might you see?

3. Maria found a grasshopper on the sidewalk. She wants to put the grasshopper where it has the best chance of surviving. She sees three areas nearby: a green meadow, a brown desert, and a black parking lot. Where should Maria put the grasshopper so it will have the best chance of surviving? Why?

4. Carla loves fish. In a small pond near her house, she noticed some small fish with long, sharp spines and other small fish with short spines. Carla saw bigger fish in the pond chasing and eating the small fish. The bigger fish chased the small fish with short spines 10 times, but they chased the small fish with long spines only one time. (a) Which small fish have a better chance of surviving—the fish with short spines or long spines? What evidence supports your answer? (b) If Carla came back to the pond many years later, what would she see? (1) Most of the fish would have long spines; (2) Most of the fish would have short spines; (3) There would be no change from today. Why did you choose this answer?

Describe the ideal response:

1. Student circles (a) the number of spots on a dog; (c) the six legs on a ladybug; and (d) the length of a sunflower's stem.

2. Many answers are possible. Three plant traits: (1) leaves, (2) petals, and (3) stems. Three traits of 10 plants: (1) plant height, (2) leaf shape, and (3) leaf size.

3. Maria should put the grasshopper in the green meadow because this is the grasshopper's environment. The grasshopper blends in with the green grass, and there's plenty of food for it to eat.

4. (a) The fish with long spines have a better chance of surviving because the big fish only chased them once. The big fish chased the fish with small spines 10 times, so they'll catch and eat more of them. This means that more of the fish with long spines will survive. (b) Years later, I think most of the small fish will have long spines because the big fish would have eaten most of the fish with short spines, and the long-spined fish would have babies with long spines.

Features of a Complete, Accurate Response	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Traits are features of an organism, not external objects like clothes.																																
Student recognizes the word *traits* and lists appropriate examples.																																
Student recognizes the word *variation* and lists appropriate examples.																																
The form of a trait (e.g., grasshopper color, cactus-thorn length) affects an organism's chances for survival.																																
Student appropriately uses evidence to support a claim about traits and survival.																																
Long-thorned plants have a better chance of surviving and reproducing so that long-thorned plants are more common in the future.																																

Features of a Complete, Accurate Response	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
The traits of individuals of the same kind of plant or animal can vary.																																
Within a species, trait variations affect which individuals survive long enough to reproduce. young and which don't.																																
Trait variations and the environment affect which plants or animals of the same kind survive long enough to produce young, and thus, which variations become more common in the next generation.																																
Organisms inherit many traits from their parents.																																

Features Consistent with Misconceptions/Problems	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
External objects like clothes are traits.																																
All individuals within a population are the same.																																
Any differences in traits (e.g., color, thorn length) are trivial and unimportant.																																
Student doesn't use evidence in a claim about how longer thorns help cacti survive.																																
Student doesn't link survival of long-thorned plants to the makeup of the population in the future.																																
All individuals within a population are the same.																																
Any differences are trivial and unimportant.																																
Every difference has a purpose.																																
Individuals can evolve or adapt.																																
Individuals adapt deliberately or through nonheritable processes because they need a given trait.																																
Inherited traits of a population undergo change because individuals observe the traits of other successful individuals and model them.																																
Changes occur in a population because all individuals experience gradual change.																																