

All Student Names: _____

Date: _____

Cherokee Physics Student Data Sheet

Laws of Motion:

Law 1: The Law of Inertia – Objects in motion tend to stay in motion and objects at rest tend to stay at rest.

Observed in Activity:

Law 2: The Law of Acceleration - The acceleration of an object is directly proportional to the net force exerted and inversely proportional to the object's mass. Force equals mass times acceleration. $F = ma$

Observed in Activity:

Law 3: The Law of Action and Reaction - For every action, there is an equal and opposite reaction.

Observed in Activity:

Conclusions Based on Observation:

1. Which length of blowgun appeared to travel faster? _____ Explain.

2. Which length of blowgun appeared to be more accurate? _____ Explain.

3. Which length of blowgun propelled the dart the farthest? _____ Why do you think that is?

4. Which struck with more force? _____ How could you tell?

5. Did you notice the effect that distance had on blowgun force and accuracy?

6. What animals would you suggest hunting with the blowgun?

7. Which would you prefer to use? Why?

8. Use the other side of this sheet to design an experiment to scientifically test observations 1-4. Include a chart to record data.

All Student Names: **ANSWER KEY**

Date: _____

Blowgun Physics Student Data Sheet

Laws of Motion:

Law 1: The Law of Inertia – *Objects in motion tend to stay in motion and objects at rest tend to stay at rest.*

Observed in Activity: The dart will remain at rest inside the blowgun until acted on by the force of blowing, which causes the dart to project out of the blowgun when it overcomes the force of friction. The dart will continue on its path until it hits another object or the force of gravity pulls it to the ground.

Law 2: The Law of Acceleration - *The acceleration of an object is directly proportional to the net force exerted and inversely proportional to the object's mass. Force equals mass times acceleration. $F = ma$*

Observed in Activity: The force of the dart is equal to the mass of the dart multiplied by its acceleration, or change in velocity.

Law 3: The Law of Action and Reaction - *For every action, there is an equal and opposite reaction.*

Observed in Activity: The force of blowing on the dart in the blowgun is equal and opposite to the force of friction holding it in place.

Conclusions Based on Observation:

1. Which length of blowgun appeared to travel faster? Explain.

Answers will vary--students should have supporting evidence to account for their answer. Generally, the shorter length will result in a reduction in friction.

2. Which length of blowgun appeared to be more accurate? Explain.

Answers will vary--students should have supporting evidence to account for their answer. Generally, the longer length will increase accuracy due to the projectile having increased time stabilizing its path.

3. Which length of blowgun propelled the dart the farthest? _____ Why do you think that is?

Answers will vary--students should have supporting evidence to account for their answer.

4. Which struck with more force? _____ How could you tell?

Answers will vary--students should have supporting evidence to account for their answer (drag/velocity).

5. Did you notice the effect that distance had on blowgun force and accuracy?

Answers will vary--students should have supporting evidence to account for their answer concerning gravity.

6. What animals would you suggest hunting with the blowgun?

Answers will vary--students should have supporting evidence to account for their answer.

7. Which would you prefer to use? Why?

Answers will vary--students should have supporting evidence to account for their answer.

8. Use the other side of this sheet to design an experiment to scientifically test observations 1-4. Include a chart to record data.