Sci 9 **Pith Ball Activity** Name: \_\_\_\_\_\_\_\_\_\_\_\_

Partner: \_\_\_\_\_\_\_\_\_\_\_\_\_

**Intro:** All matter is made of atoms. Atoms have both positive and negative charges. Some charges can be transferred.

**Materials**: Pith ball on a stand, acetate strip, vinyl strip, paper towel.

1. The pith ball is **neutral.**Rub an *acetate strip* with a *paper towel*, giving it a ***positive charge.***Slowly bring the acetate strip closer to the hanging pith ball but don’t let it touch. Pull the acetate strip away before it touches. Describe what happened.

1. Rub a **vinyl** strip with paper towel to give it a ***negative charge*.** Bring it close to the pith ball but not touching. What does the pith ball do? Set strip aside.
2. Recharge the acetate strip, this time letting it touch the pith ball. Remove. Recharge the acetate strip again and slowly bring it near. What does the pith ball do this time?
3. Gently touch the pith ball with your fingers to "ground" (discharge) it. Repeat step 3 with a negatively charged vinyl strip. What does the pith ball do?
4. Ground the pith ball again with your fingers. Let a charged strip touch the pith ball, remove, and bring the other, oppositely charged strip near. What does the pith ball do?
5. Ground the ball. Describe what the pith ball does when you bring any charged any strip within 10cm, 5 cm, 2 cm from the pith ball.

**Conclude and Apply:**

1. All of the objects began neutral. But later became charged in various ways. Explain how the pith ball was able to become positively charged? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Explain how can the pith ball became negatively charged?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. What three types of charges did you witness in this activity?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Knowing what you know about atomic structure, what *particles* do you think are being transferred to create a charge:

Between acetate strip and pith ball: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Between vinyl strip and pith ball: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Play around some more with the pith ball to answer the combinations below with the following format: What happens when a \_\_\_\_\_\_\_\_come close to a \_\_\_\_\_\_\_\_?

d) Positive strip + neutral pith ball \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e) Positive strip + positive pith ball? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

f) Negative strip + negative pith ball? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

g) Positive strip + negative pith ball? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

h) Neutral strip + neutral pith ball? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Use your observations from Step 6 to summarize the relationship between the force of attraction and **distance.**

7. Proficient/ Extending: Explain how you would know if a pith ball was negative? What would be the proof?