Name _____

The Great Magnet Race (Magnetic Force & Orientation)

Learning Objective: Students will investigate how the orientation (which poles are facing each other) of two magnets causes an effect on the direction of the magnetic force (attraction or repulsion).

Focus Question: What happens when you bring different ends (poles) of two magnets together?

Materials (per pair or small group):

- 2 bar magnets (marked with N for North and S for South)
- 2 small toy cars (or a smooth surface like a tray)
- Student science notebook or worksheet

Investigation Procedure:

1. Plan & Predict:

- Introduce the terms attract (pull together) and repel (push apart).
- Ask: "What do you think will happen if we put the North pole of one magnet near the South pole of another? What about North and North?" Have students draw their predictions.

2. Conduct the Experiment - Part A (The Push and Pull):

- Students will place one magnet on a table and hold the other in their hand.
- They will test four combinations:

1. North pole of the hand magnet facing the South pole of the table magnet.
2. South pole of the hand magnet facing the North pole of the table magnet.
3. North pole facing North pole.
4. South pole facing South pole.

- For each test, they record whether the magnets attracted or repelled.

3. Conduct the Experiment - Part B (The Race):

- To make it more fun, have students place a magnet on top of each toy car.
- Line them up at a starting line with the North pole of one car facing the South pole of the other. Gently push one car towards the other and observe.
- Now, flip one car so that North faces North. Gently push one car towards the other and observe.

4. Conclusion & Cause/Effect Discussion:

- Discuss: "When did the magnets help the cars move together? When did they stop the cars or push them apart?"
- Identify the Cause and Effect: Guide students to state the relationship: "The cause was putting two opposite poles (N-S) together. The effect was attraction (a pull). The cause was putting two of the same poles (N-N or S-S) together. The effect was repulsion (a push)."

Name _____

Data Collection:

Test	Poles Facing Each Other	Result (Attract or Repel?)
1	N → S	_____
2	S → N	_____
3	N → N	_____
4	S → S	_____

Analysis:

1. What pattern do you see in your results? _____

_____

_____

2. When did the magnets pull together? _____

_____

3. When did they push apart? _____

_____