Create the Strongest Electromagnet

TEAM NAME: **DATE:**

Procedures

1. Wrap a nail with 32 inches (81 cm) of 22 gauge magnet/solenoid wire. You are creating a coil around a core.
2. Sand 1 1/4 inches (3.2 cm) of the insulation from the two ends of the wire.
3. Sketch your design in the space below. Label each item and write down the number of times the wire was wrapped around the nail.
4. Test your electromagnet by moving it toward the magnetic compass to see if it causes the needle to move. Note the distance at which the needle first moved.
5. Take your design to the test station and record the results on this sheet.
6. Repeat steps 1–5 to create at least three different designs.
7. Record all of your results in the Summary Table.

Design A (Prototype)

Distance at which the compass needle first moved: _____

Number of paper clips lifted: _____

Design B

Distance at which the compass needle first moved: _____

Number of paper clips lifted: _____

Design C

Distance at which the compass needle first moved: _____

Number of paper clips lifted: _____

Test Results

Summary Table

	Core nail size	Wire size	Number of wraps in the coil	Distance from compass	Number of paper clips or chain links lifted
Design A					
Design B					
Design C					

Part II

Worksheets

Vocabulary

NAME: DATE:

Write definitions to the following terms in complete sentences and in your own words. You may use dictionaries or science books to help you with definitions. Use examples from the challenges that you have completed.

magnet _____

_____

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force _____

_____

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field _____

_____

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_____

compass _____

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_____

_____

electromagnet _____

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_____

coil _____

_____

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_____

core _____

_____

_____

_____

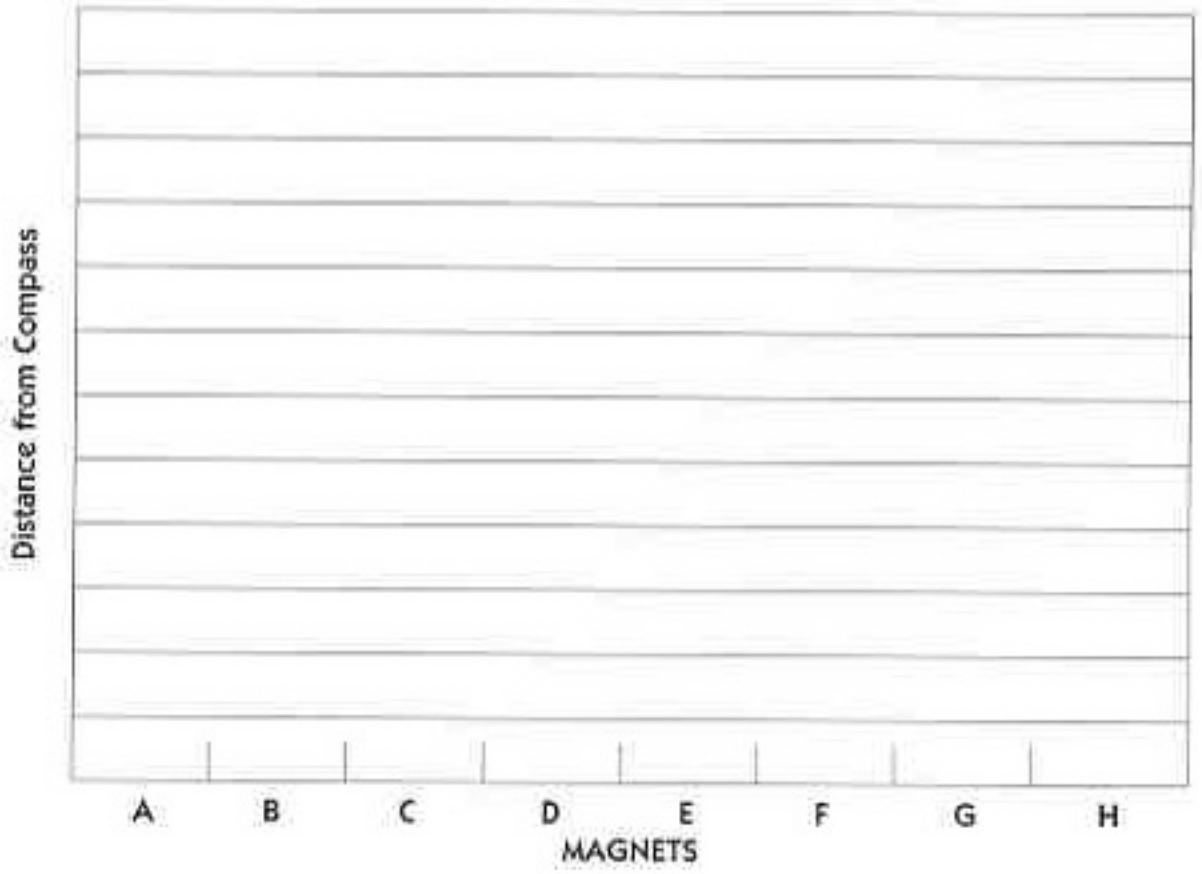
Graphing

NAME: DATE:

Using the data from the challenges, create the following graphs.

Challenge 1: Find the Strongest Magnet

Create a bar graph that shows the distance from the compass for each permanent magnet that you tested.



NAME: DATE:

Challenge 3: Create the Strongest Electromagnet

Create a bar graph that shows the number of paper clips lifted for each electromagnet that you created and tested.