

Supervillain Detention!

Your team has just helped Elemento, a superhero, to capture Dr. Chrono, a local villain who has the superpower to speed up time and can produce water from her fingers. This can cause some metals to rust and crumble instantly. She can also control metals that are magnetic. She must remain in our custody until she can be taken to the police for questioning.



There is a small room that we can use but we will need to keep the door closed so she can't sneak out while we rest. Several types of nails/fasteners are available but we must be careful. Elemento is vulnerable to aluminum (it is toxic and makes him weak). His superpower is heat which is used to melt any plastic he touches.

Your task is to examine the available nails/fasteners and suggest what Elemento should use to secure the door to Dr. Chrono's place of temporary confinement. You will make a recommendation based on evidence from your tests and observations.

Complete the data table below about the strengths and weaknesses of Dr. Chrono and Elemento.

| Dr. Chrono | Elemento |
|-------------------|-----------------|
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In your group, brainstorm at least five characteristics or properties of six materials that you can test.

Here are the materials that are available for testing:

- Aluminum foil
- Aluminum nail

- Battery and bulb
- Common Iron nail
- Concrete screw
- Copper nail
- Galvanized nail
- Wooden dowel or lathe
- Hand lenses
- Magnets
- Plastic screw or anchor
- Sandpaper
- Small cups of water and lime or lemon juice
- Small magnets
- Stainless steel nail
- Tape

Chemists use specific characteristics or properties to describe and classify materials. Electrical conductivity: Test each substance to see if it will conduct electricity by connecting the sample in a battery and bulb circuit with aluminum strips.

Data Table

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Describe each sample that you tested. Could someone else reading your descriptions be able to identify the material that you tested?

Summary description of Sample 1

Summary description of Sample 2

Summary description of Sample 3

Summary description of Sample 4

Summary description of Sample 5

Summary description of Sample 6

You investigated specific properties of materials including metals. Write a statement to explain your strategy to keep Dr. Chrono contained in the detention center. Be sure to include evidence from your testing.



Draw a diagram of your containment system for Dr. Chrono. Be sure to label the types of materials used.

