Name: ______________________

Sandbox

Background
A mixture consists of two or more substances that are physically intermingled, but not combined chemically. It can be separated into its individual components by physical means, and often retains many of the properties of its components. Magnetism is a force that can attract (pull closer) or repel (push away) objects that are made of a magnetic material.

Pre-lab Questions
1. What do you observe in the sandbox?
2. Can the objects inside be separated from the sand?
3. How would the objects and sand change if they are separated?
4. What tool(s) can be used to separate the objects?
5. What type of objects could be separated with the magnet?

Objective
Use your knowledge of magnetism to help you determine how to separate the mixture in the sandbox.

Procedure
1. Draw what you observe in the sand box (before exploring) in the space below.
2. Use the magnet as a tool to separate as many objects as possible from the sand box.
3. Use your hands to separate the remaining objects.
4. Draw your observation after exploring in the space below.

Results

Before

After
**Classify:** Write the name of the objects that you could separate from the mixture using the magnet in the “magnetic objects” column, and the objects that did not attract to the magnet in the “non-magnetic” column.

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<thead>
<tr>
<th>Magnetic objects</th>
<th>Non-magnetic objects</th>
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**Analysis**

1. Did the components of the mixture change from “before” to “after”?

2. How did the magnet help separating the mixture? What can you conclude about using tools to separate mixtures?

3. What characteristics did you observe in the magnetic objects? What do all magnetic objects have in common?

4. What characteristics did you observe in the non-magnetic objects?

5. Is it possible to create the same mixture again and separate it?

6. How can the physical properties of objects be helpful? Think about other physical properties, such as size, what other tool could you use to separate the sand from the objects?

7. What physical properties were observed in this investigation?
8. Think about another situation where you needed to separate a mixture, what physical properties help you decide which tools that you need to use?

9. Read the next situations and talk to your partner to decide how to separate the mixtures:
   a. Your mom asks you to help her with the laundry. She reminds you to make sure to wash like colors.
   b. You are helping baking a cake, and the recipe requires that you separate the egg yolk from the egg white.

**Research Extension**
How is oil separated from the ocean water after an oil spill? What tools are used? Are these tools related to oil and water physical properties?