

# Teaching by Design

ELEMENTARY SCIENCE

CATEGORY 1

# Day 3

**5.5B CREATE AND DEMONSTRATE SOME MIXTURES SUCH AS IRON FILINGS AND SAND AND SAND AND WATER AND RECOGNIZE HOW INGREDIENTS MAINTAIN PHYSICAL PROPERTIES.**

5.2B ASK WELL DEFINED QUESTIONS, FORMULATE TESTABLE HYPOTHESES, AND SELECT AND USE APPROPRIATE EQUIPMENT AND TECHNOLOGY;

5.2C COLLECT AND RECORD INFORMATION USING DETAILED OBSERVATIONS AND ACCURATE MEASURING;

5.2D ANALYZE AND INTERPRET INFORMATION TO CONSTRUCT REASONABLE EXPLANATIONS FROM DIRECT (OBSERVABLE) AND INDIRECT (INFERRED) EVIDENCE;

5.2F COMMUNICATE VALID CONCLUSIONS IN WRITTEN FORM

5.2G CONSTRUCT APPROPRIATE SIMPLE GRAPHS, TABLES, MAPS, AND CHARTS USING TECHNOLOGY, INCLUDING COMPUTERS, TO ORGANIZE, EXAMINE, AND EVALUATE INFORMATION.

5.3A ANALYZE, EVALUATE, AND CRITIQUE SCIENTIFIC EXPLANATIONS BY USING EVIDENCE, LOGICAL REASONING, AND EXPERIMENTAL AND OBSERVATIONAL TESTING

# Problem of the Day

- ▶ Observe/Analyze the 2 ingredients shown below. Create a solid-solid mixture and record the ingredients' physical properties before and after.

## Ingredient 1

25g rubber bands

## Ingredient 2

25g paper clips



- ▶ Conductivity:
- ▶ Physical State:
- ▶ Mass:
- ▶ Density

Before	After Mix	Before	After Mix

5 minutes

# Content Objective

- ▶ I WILL...**CREATE** and **DEMONSTRATE** some mixtures such as iron filings and sand and sand and water and **RECOGNIZE** how ingredients maintain physical properties.

# Language Objective

3 minutes

# Key Points to Learn

ELPS 2.G, 2.H, 2.I, 4.G, 4.H

- ▶ **Matter can be described by physical properties.**
- ▶ **A mixture can be created by combining different samples of matter together.**
- ▶ **The physical properties REMAIN THE SAME of the different samples of matter when creating a mixture.**

# Explain/Evaluate Activity (Interact) ELPS 3.E, 3.F, 3.G, 3.H, 3.J,

- Observe/Analyze the 2 ingredients shown below. Create a solid-solid mixture and record the ingredients' physical properties before and after.

## Ingredient 1

20g Buttons

## Ingredient 2

20g Marbles

- Magnetism:
- Conductivity:
- Mass:
- Solubility:
- Physical State:
- Density:

Before Mix	After Mix	Before Mix	After Mix

5 minutes

# Explain/Evaluate Activity (Interact) ELPS 3.E, 3.F, 3.G, 3.H, 3.J,

- ▶ Observe/Analyze the 2 ingredients shown below. Create a solid-liquid mixture and record the ingredients' physical properties before and after.

## Ingredient 1

20g Raisins

## Ingredient 2

40mL Water

	Before Mix	After Mix	Before Mix	After Mix
▶ Magnetism:				
▶ Conductivity:				
▶ Mass:				
▶ Solubility:				
▶ Physical State:				
▶ Taste:				

5 minutes



# Formative Assessment

ELPS 3.E, 3.F, 3.G, 3.H, 3.J, 5.F, 5.G

- ▶ **Think-Pair-Share/1 minute Essay**
- ▶ Describe what happened to the 6 physical properties of the ingredients as they were mixed together.
- ▶ Did the physical properties remain the same or did they change? How do you know?

2 minutes

# Guided Practice “I do We do”

ELPS 3.E, 3.F, 3.G, 3.H, 3.J, 5.F, 5.G

- ▶ Observe/Analyze the 2 ingredients shown below. Create a solid-solid mixture and record the ingredients' physical properties before and after.

**Ingredient 1**

20g plastic spoons

**Ingredient 2**

20g metal spoons

	Before Mix	After Mix	Before Mix	After Mix
▶ Magnetism:				
▶ Conductivity:				
▶ Mass:				
▶ Solubility:				
▶ Physical State:				
▶ Density:				

5 minutes

# Guided Practice “I do We do”

ELPS 3.E, 3.F, 3.G, 3.H, 3.J, 5.F, 5.G

- ▶ Observe/Analyze the 2 ingredients shown below. Create a solid-liquid mixture and record the ingredients' physical properties before and after.

**Ingredient 1**

20g sugar

**Ingredient 2**

20mL lemon juice

	Before Mix	After Mix	Before Mix	After Mix
▶ Magnetism:				
▶ Conductivity:				
▶ Mass/Volume:				
▶ Physical State:				
▶ Taste:				

5 minutes

# Guided Practice “I do We do”

ELPS 3.E, 3.F, 3.G, 3.H, 3.J, 5.F, 5.G

- ▶ Observe/Analyze the 2 ingredients shown below. Create a liquid-liquid mixture and record the ingredients' physical properties before and after.

**Ingredient 1**

20mL water

**Ingredient 2**

20mL olive oil

- ▶ Magnetism:
- ▶ Conductivity:
- ▶ Volume:
- ▶ Taste:
- ▶ Physical State:
- ▶ Color:

Before Mix	After Mix	Before Mix	After Mix

5 minutes

# Independent Practice (Speak/Write)

Foundations in Teaching®

ELPS 3.E, 3.F, 3.G, 3.H, 3.J, 5.F, 5.G

- ▶ Observe/Analyze the 2 ingredients shown below. Create a solid-solid mixture and record the ingredients' physical properties before and after.

## Ingredient 1

20g sand

## Ingredient 2

20g metal washers

- ▶ Magnetism:
- ▶ Conductivity:
- ▶ Mass:
- ▶ Solubility:
- ▶ Physical State:
- ▶ Density:

Before Mix	After Mix	Before Mix	After Mix

10 minutes

# Independent Practice (Speak/Write)

Foundations in Teaching®

ELPS 3.E, 3.F, 3.G, 3.H, 3.J, 5.F, 5.G

- ▶ Observe/Analyze the 2 ingredients shown below. Create a solid-liquid mixture and record the ingredients' physical properties before and after.

## Ingredient 1

20g salt

## Ingredient 2

20mL water

- ▶ Magnetism:
- ▶ Conductivity:
- ▶ Mass/Volume:
- ▶ Physical State:
- ▶ Taste:

Before Mix	After Mix	Before Mix	After Mix

10 minutes

# Independent Practice (Speak/Write)

Foundations in Teaching®

ELPS 3.E, 3.F, 3.G, 3.H, 3.J, 5.F, 5.G

- ▶ Observe/Analyze the 2 ingredients shown below. Create a liquid-liquid mixture and record the ingredients' physical properties before and after.

## Ingredient 1

20mL syrup

## Ingredient 2

20mL water

- ▶ Magnetism:
- ▶ Conductivity:
- ▶ Volume:
- ▶ Taste:
- ▶ Physical State:
- ▶ Color:

Before Mix	After Mix	Before Mix	After Mix

10 minutes

# Formative Assessment

ELPS 3.E, 3.F, 3.G, 3.H, 3.J, 5.F, 5.G

- ▶ **Summary Writing 3 complete sentences**
- ▶ How do you create a solid-solid mixture? A solid-liquid mixture? A liquid-liquid mixture?
- ▶ Do the ingredients of the mixtures change their physical properties when mixed?

2 minutes



# Closure

ELPS 2.G, 2.H, 2.I, 5.F, 5.G

- ▶ **Matter can be described by physical properties.**
- ▶ **A mixture can be created by combining different samples of matter together.**
- ▶ **The physical properties REMAIN THE SAME of the different samples of matter when creating a mixture.**

5 minutes

# Testable Format based on Content Objective

Foundations in Teaching®

ELPS 5.F, 5.G

Some people add sugar to their hot tea. Which property of the sugar remains the same when the sugar is in the tea solution?

The taste of the sugar

The size of the sugar crystals

The color of the sugar

The texture of the sugar

# Testable Format based on Content Objective

Foundations in Teaching®

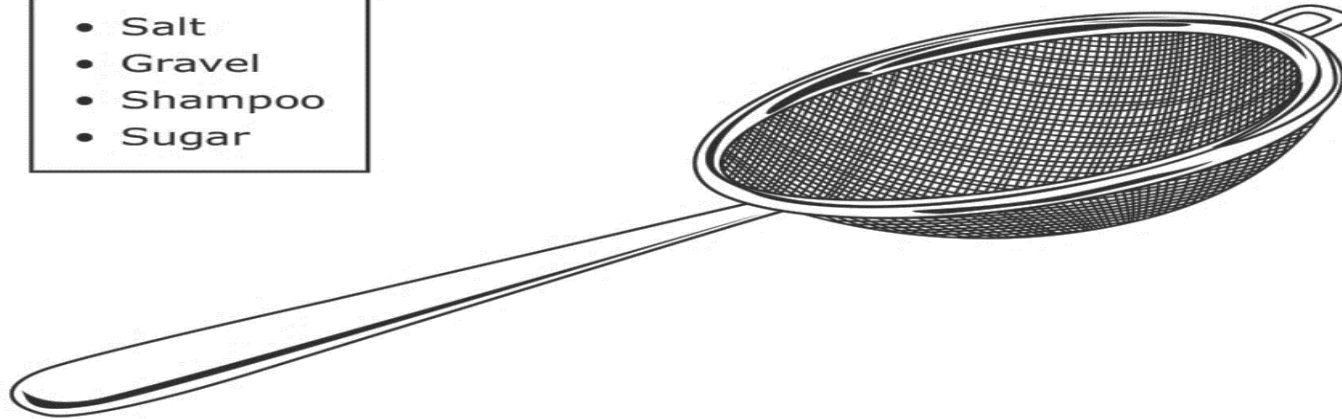
ELPS 5.F, 5.G

A student stirs 15 grams of each substance listed below into 200 milliliters of water to form four different mixtures. The student then tries to separate the water from each mixture by pouring the mixture through a kitchen tea strainer.

## Substances

- Salt
- Gravel
- Shampoo
- Sugar

## Kitchen Tea Strainer



Which mixture can the student separate most easily with the strainer?

Salt and water

Gravel and water

Shampoo and water

Sugar and water