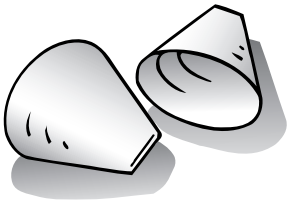
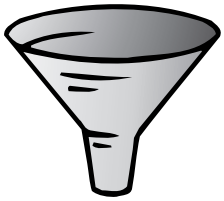
Chapter Science Investigation Name _____

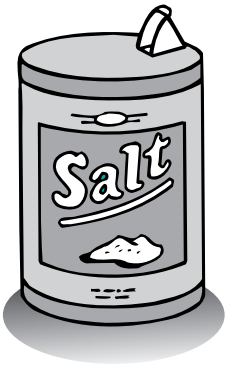
Separating Solutions and Mixtures

What You Need


filter paper

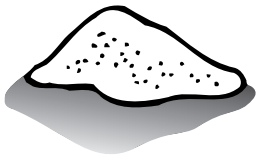

funnel

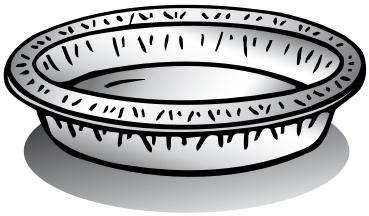
liter pitcher



salt


water


sand


aluminum pie pan

Find Out

Do this activity to learn how you can separate solutions and mixtures.

Process Skills

Measuring
Predicting
Observing
Communicating

Time

- 30 minutes the first day
- 10 minutes each day for one week

What to Do

1. Place the filter paper inside the funnel.

2. Mix equal parts of sand and salt. Place the mixture inside the funnel.

3. Use the liter pitcher to **measure** 500 mL of water. Hold the funnel over the pie pan. Pour the water into the funnel so that the water empties into the pie pan. **Predict** what will happen.

4. **Observe** what happens and **record** the results on the chart.

5. Carefully remove the filter and unfold it. Set the filter aside.

6. **Observe** the water in the pie pan. Put the pan in a window or other sunny place.

7. **Predict** what will happen to the water after it sits in the sun.

8. **Observe** the water every day for one week.

9. **Record** what happens.

Separating Solutions and Mixtures	
Day/Time	**Observations**
Day 1	
Day 2	
Day 3	
Day 4	
Day 5	

Conclusions

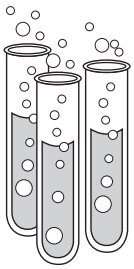
1. How did you separate the sand from the water?
by filtering the sand with water, filter paper, and a funnel

2. How did you separate the salt from the water?
by evaporating the water, so that the salt is all that remains

New Questions

1. What is another way to separate mixtures and solutions?
Accept any reasonable answer.

2. Write a new question you have about mixtures and solutions.
Accept any reasonable question.



Name _____

ACTIVITY

Describing Matter

The Block

How long is the block? How wide is the block?
Answers will depend upon the block.

What color is the block?
Answers will depend upon the block.

How does the block feel? Is it smooth? Is it hard? Is it rough?
Students will probably answer that the block is hard and smooth.

What happens to the block when you put it into a container?
nothing

Water

What shape does the water in the measuring cup have?
the shape of the cup

What happens to the water when you pour it into the bowl?
It takes the shape of the bowl.

Pour the water back into the measuring cup. Did the amount change?
no

Air

What is the shape of the air in the balloon?
the shape of the balloon

How can you change the shape of the air in the balloon?
by squeezing the balloon

Name _____

Conclusions

1. How was the water different from the block?
The block had a definite shape and size; it had color; it did not change shape as easily as the water did.

2. How was the air inside the balloon different from both the water and the block? Was it easy to change the size and shape of the air?
It did not have a definite shape; it was easy to change its shape.

3. Think about the activity you just did. Complete a chart of characteristics of five different objects.
Students should complete the chart.

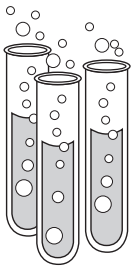
Asking New Questions

1. What shape does air take when you fill a bicycle tire?
the shape of the tire

2. Could you pump more air into the bicycle tire without making the tire bigger?
Yes, gas can be squeezed into a smaller space.

3. List the five objects in the chart you completed. Does each object exist as a solid, a liquid, or a gas? Make a check mark in the columns that apply. Compare your chart with a classmate's chart.

Object	Characteristics	Solid	Liquid	Gas



Name _____

ACTIVITY

Observing a Chemical Change

Which pieces of steel wool do you **predict** will rust? Write an X beside each kind you think will rust.

Steel Wool in Water

Answers will vary. Students may predict that the steel wool in water will rust; they may also think that the steel wool in oil and water will rust.

Steel Wool in Oil and Water

Steel Wool

What happened to the three pieces of steel wool? Which pieces rusted? Write an X beside each kind that rusted.

The steel wool in water rusted.

Steel Wool in Water

Steel Wool in Oil and Water

Steel Wool

Name _____

Conclusions

1. What kinds of matter formed the rust?
steel, air, moisture

2. Is rust the result of a physical change or a chemical change? Why?
a chemical change, because rust is a new substance formed by the combination of substances

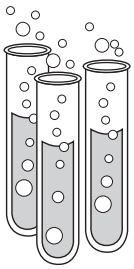
3. Compare your predictions about changes to the steel wool to your observations.
Answers will vary based on predictions and observations.

Asking New Questions

1. What other objects around you do you think might rust?
Students should identify other metal objects.

2. What would need to happen before rust could form on these objects?
They would need to be exposed to both moisture and air.

3. How do you think you could prevent rust?
Possible answer: Put a protective coating on the metal.



Name _____

ACTIVITY

Measuring a Change in Energy

How far did the marble roll? **Record** your measurements.

	Pencil	**Book**
Trial 1		
Trial 2		

Draw a picture that shows how far the marble rolled when you used the book.

Trial 1

Trial 2

Name _____

Conclusions

1. Which ramp caused the marble to roll farther, the pencil ramp or the book ramp? Why?
the book ramp, because the marble on the steeper ramp had more stored energy

2. At what point in this activity did the marble have the most stored energy?
The marble had the most stored energy when it was at the top of the ramp before being let go.

3. Were your measurements the same the second time you made them?
Students responses may vary. Results of similar scientific investigations seldom turn out exactly the same because of differences in the things being investigated or methods being used, or because of uncertainty in the observation. Students may wish to repeat their measurements several times to improve the accuracy of their data.

Asking New Questions

1. What would happen if you made the ramp even higher by putting two books under the raised end?
The marble would travel farther because it would have more stored energy.

2. What sports activities use stored energy to make people and objects move quickly?
Answers will vary but may include sledding, skiing, diving and so on.