

Name:

Date:

Proportion and Percent: Thinking Skills Lesson 2

Student Activity

Comparison: Movie House Management

- STEPS:**
1. Identify the items you are comparing.
 2. List features of the items you are comparing.
 3. Decide how items are similar or different for each feature.
 4. Summarize what you have learned.

Here is the problem that appeared in the lesson:

In the lesson, you considered opening a movie theater. Your problem was not knowing what to charge for tickets. You compared profits for three different ticket prices.

Directions: Now try a price of \$7 per ticket and assume only 50 people come at that price. For this new price, compute the same features:

$$\text{INCOME} = \text{TICKET PRICE} \times \text{NUMBER in CROWD}$$

$$\text{COSTS} = 20\% \text{ of INCOME} + \$150$$

$$\text{PROFIT} = \text{INCOME} - \text{COSTS}$$

$$\text{PROFIT RATIO} = \text{PROFIT} \div \text{INCOME}$$

Then compare the results with this table from the lesson:

	Option A	Option B	Option C
Tickets	\$ 3.00	\$ 4.50	\$ 5.00
Crowd	90	75	60
Income	\$270.00	\$337.50	\$300.00
Costs	\$204.00	\$217.50	\$210.00
Profit	\$ 66.00	\$120.00	\$ 90.00
Profit Ratio	24.4%	35.6%	30%

In the lesson, you concluded that \$4.50 was the best ticket price to use. Do you still agree with this conclusion? What other situations would you test if you were really going to open the movie house?

Write Idea: Social scientists study information about people. They use comparison to examine similar information about different population groups such as recent immigrants. They might study population size, education levels, or life expectancy. In this way, they can see what needs improvement. Write about something you think needs improvement. What kind of information would you need to compare to prove your case?

Name:

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Introduction to Algebra: Thinking Skills Lesson 1

Student Activity

Prediction: Number Sequence Puzzles

- STEPS:**
1. Identify the facts that you know.
 2. Look for patterns in the information.
 3. Make a general statement that explains the patterns you have observed.
 4. Based on your conclusions, predict the next event (or number).
 5. Make more observations to see if you have predicted correctly.

In the lesson, you explained the patterns for and predicted numbers in these sequences:

Sequence: 0, 1, 1, 2, 3, 5, ...

Pattern: Each number is the sum of the previous two numbers.

Sequence: -15°C , -11°C , -7°C , -3°C , $+1^{\circ}\text{C}$, $+5^{\circ}\text{C}$, $+9^{\circ}\text{C}$, ...

Pattern: The temperature gets 4° warmer every two hours.

Sequence: 2, 4, 8, 16, 32, 64, ...

Pattern: $t = 2^n$

Sequence: 0.000025, 0.0025, 0.25, 25.00, ...

Pattern: Each new number is the previous number multiplied by 10^2 .

Directions: Now apply your prediction skills to this number sequencing problem. Your friend is saving for a new radio. It costs \$36.50. She started with a quarter. Now she saves the same amount from her allowance each week. Here is how the savings account is growing:

Week	Amount
1	\$0.25
2	\$1.50
3	\$2.75
4	\$4.00

Predict how many weeks it will take to reach the goal of \$36.50.

Write Idea: Scientists use the prediction process to warn people about natural disasters. Imagine this situation. A river is 72 inches deep. Rain is causing the river to rise at a rate of two inches per hour. The river will flood at 96 inches. Write a paragraph about how scientists could use the prediction process and number sequences to predict how many hours of rain will cause the river to flood.

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Introduction to Algebra: Thinking Skills Lesson 2

Student Activity

Decision Making: Buying a House

- STEPS:**
1. Identify the decision you need to make.
 2. List all the choices available to you.
 3. Identify the important information that you must consider when making your decision.
 4. Determine the outcome of each choice.
 5. Evaluate your choices and summarize what you have learned. Then make your decision.

Here is the problem that appeared in the lesson:

You have a very important decision to make. You would like to buy a house. You want the tax deduction that a house provides. You would also enjoy remodeling and decorating your own place. You know that buying a house is not something to rush into. There are many facts to consider when making this decision.

- The price of one house you like is \$70,000.
- The price of another house you like is \$95,000.
- Your income is \$24,000 a year.

You have to decide if you can buy one of these houses.

Directions: You have just gotten a big promotion at work. Your salary was raised to \$30,000 a year. You determine that the monthly payment for the \$95,000 house is \$771.28 including property taxes. Remember, the bank will lend you the money if 30% of your monthly income is greater than or equal to your monthly payment. Write an equation that will determine whether your monthly salary is greater than or equal to the payment for the \$95,000 house. Will the bank lend you the money for the more expensive house?

Write Idea: Determining whether or not to buy a house is one of the most important decisions a person can make. Think of another important decision that does not involve buying something, maybe taking one class versus another, or choosing one job over the other. After stating the decision, list the possible choices, the outcome of each choice, and then summarize what you've learned.

Name:

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Geometry: Thinking Skills Lesson 2

Student Activity

Problem Solving: Building a Sandbox

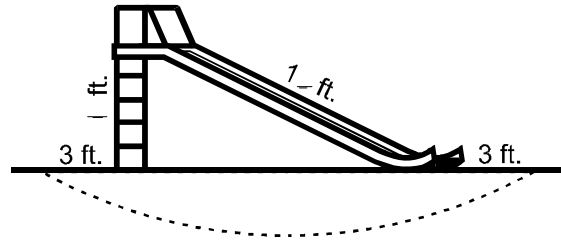
- STEPS:**
1. Identify your goal.
 2. Identify limiting conditions.
 3. Identify ways to meet the limiting conditions.
 4. Identify and try possible solutions.
 5. Evaluate your possible solutions.

Here is the problem that appeared in the lesson:

Your neighborhood has collected \$200 to build a sandbox for the playground. You are in charge of the project. The land available for the sandbox is 8 feet by 5 feet with a tree in the corner. You want to make the sandbox as large as possible, but you have a limited amount of space available. The tree cannot be inside the sandbox. Volunteers will build the sandbox, but they can only build simple 90° corners. Since you are in charge of the project, it's up to you to solve these problems and produce a sandbox.

Directions: You solved the sandbox problem. Now the committee has asked you to research adding a circular sand pit around the sliding board. The major limiting condition is the space allowed for the sliding board and sand pit, so you must find the area of the circle. Use these dimensions to find the area of the circular sand pit:

- The sliding board ladder is 6 feet tall.
- The sliding board is 10 feet long.
- The ladder forms a 90° angle with the ground.
- The sand should extend 3 feet beyond the end of the sliding board and 3 feet beyond the ladder.



Hint: First, use the Pythagorean Theorem to find the length between the sliding board and the ladder. Then, add 3 feet on each side to find the diameter of the circle.

Write Idea: Another problem that has come up in relation to the playground is children getting hurt while playing. Describe a possible solution to this problem? Are there limiting conditions to your solution? If so, how would you meet those limiting conditions?

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Statistics and Probability: Thinking Skills Lesson 2

Student Activity

Prediction: The Real Cost of Living

- STEPS:**
1. Identify the facts that you know.
 2. Look for patterns in the information.
 3. Make a general statement that explains the patterns you have observed.
 4. Based on your conclusions, predict what might happen in a new situation.
 5. Make more observations to see if you predicted correctly.

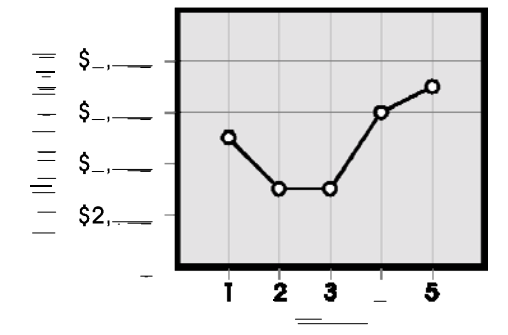
In the lesson, you used the prediction process to complete this table:

	5 years ago	Present	% of change	Change/year
Savings	\$47	\$50	6%	1.2%
Expenses	\$781	\$890	14%	2.8%
Income	\$785	\$892	13.6%	2.7%

You predicted that your salary needed to increase 3% a year for you to meet expenses and increase your savings.

Directions: Now apply your prediction skills to this problem. You are in charge of fund raising at your local high school. This graph shows the results of fund-raising efforts at the school for each of the past five years.

1. Identify the mean, median, and mode of the fund-raising dollars for the past five years.
2. You want to set a goal for year 6 that is based on a reasonable prediction. If the upward trend from years 3-5 continues, what is your prediction for dollars to be raised in year 6? Describe your procedure for arriving at this prediction.



Write Idea: Air pollution is increasing. Scientists know that if it continues to increase at high rates, our air will become toxic. Science has the numbers it needs. What is needed is a plan for predicting. Write a plan for scientists to predict how many years it will take our air to become toxic. Remember the steps of the prediction process.

