

# **Strategy Connections**

Alton Central School

# **STRATEGY SEEKERS UNIT PLAN**

## **Grade Level:**

Sixth Grade Enrichment students

**Purpose:** We will use the TV studio as a fun medium to teach and integrate math strategies in solving word problems. This plan also incorporates writing and speaking skills. We plan to expand this project and make it available to all students incorporating other academic subjects.

## **Objectives:**

1. Students will be able to solve word problems using up to five strategies learned.
2. Students will be able to show different strategies to solve the same word problems.
3. Students will be able to operate all aspects of the studio hardware.
4. Students will be able to write an effective script for themselves.
5. Students will be able to speak effectively to the appropriate audiences.

## **Strategies:**

Find a Pattern

Make a Table

Work Backwards

Guess and Check

Draw a Picture

Make a List

Write a Number Sentence

Use Logical Reasoning

## **Unit Plan (1- 60 minute period per week):**

### **Week 1**

- Discussion about the project
- Reviewed rubric
- Gave out strategy worksheet
- Modeled how the same problem can be solved different ways
- Created a simple word problem and asked the students to solve it and to explain to the group how they solved it

### **Week 2**

TV:

- Together we wrote a sample script using PowerPoint

MATH:

- Reviewed how to solve pattern word problems
- Students (in pairs) wrote their own patterns and wrote a script to teach how to solve it

Sample Question (teacher generated): Bill has written a number pattern that begins with 1, 4, 8, 13, 19. If he continues this pattern, what are the next four numbers in his pattern?

Strategy:

1) UNDERSTAND: What do you need to find? You need to find 4 numbers after 19.  
2) PLAN: How can you solve the problem? Look at the numbers. The new number depends upon the number before it.

3) SOLVE: Look at the numbers in the pattern.

$$4 = 1 + 3 \text{ (starting number is 1, add 3 to make 4)}$$

$$8 = 4 + 4 \text{ (starting number is 4, add 4 to make 8)}$$

$$13 = 8 + 5 \text{ (starting number is 8, add 5 to make 13)}$$

$$19 = 13 + 6 \text{ (starting number is 13, add 6 to make 19)}$$

New numbers will be

$$19 + 7 = 26$$

$$26 + 8 = 34$$

$$34 + 9 = 43$$

$$43 + 10 = 53$$

### Week 3

TV:

- 3 of the 8 sets of partners shared their pattern presentation and the class critiqued the performance using the rubric
- After the 3 pairs were critiqued they revised their presentation for final output
- The entire class reviewed the equipment to be used in filming and how to operate each piece

MATH:

- Discussed how to solve word problems by making a table
- Students (in pairs) wrote their own word problems using a table and wrote a script to teach how to solve it

Sample Question (teacher generated): You save \$7.45 on Monday. Each day after that you save twice as much as you saved the day before. If this pattern continues, how much would you save on Friday?

Strategy:

1) UNDERSTAND: You need to know that you save \$7.45 on Monday. Then you need to know that you always save twice as much as you find the day before.

2) PLAN: How can you solve the problem? You can make a table (see below). List the amount of money you save each day. Remember to double the number each day.

Day	Amount of Money Saved
Monday	\$ 7.45
Tuesday	\$ 14.90
Wednesday	\$ 29.80
Thursday	\$ 59.60
Friday	\$119.20

You save \$119.20 on Friday

#### **Week 4**

TV:

- 3 pairs who worked on the pattern presentations filmed their final presentation for distribution to grades 1 through 5. The students operated all filming equipment. Editing was very minimal due to preparation.
- 3 pairs shared their making a table presentation and the class critiqued the performance using the rubric
- After the 3 pairs were critiqued they revised their presentation for final output

MATH:

- Discussed how to solve word problems by working backwards
- Students (in pairs) wrote their own working backwards word problems and wrote a script to teach how to solve it

Sample Question (teacher generated): Lucy walked from Alton to Rochester. It took 1 hour 25 minutes to walk from Alton to Farmington. Then it took 40 minutes to walk from Farmington to Rochester. She arrived in Rochester at 5:45 P.M. At what time did she leave Alton?

Strategy:

- 1) UNDERSTAND: What do you need to find? You need to find what the time was when Lucy left Alton.
- 2) PLAN: How can you solve the problem? You can work backwards from the time Lucy reached Rochester. Subtract the time it took to walk from Farmington to Rochester. Then subtract the time it took to walk from Alton to Farmington.
- 3) SOLVE: Start at 5:45. This is the time Lucy reached Rochester. Subtract 40 minutes. This is the time it took to get from Rochester to Farmington. Time is: 5:05 P.M. Subtract: 1 hour 25 minutes. This is the time it took to get from Alton to Farmington. Lucy left Alton at 3:40 P.M.

#### **Week 5**

TV:

- 3 pairs who worked on the make a table presentation filmed their final presentation for distribution to grades 1 through 5. The students operated all filming equipment.
- 3 pairs shared their working backward presentation and the class critiqued the performance using the rubric
- After the 3 pairs were critiqued they revised their presentation for final output

MATH:

- Discussed how to solve word problems by using the guess and check method
- Students (in pairs) wrote their own guess and check word problems and wrote a script to teach how to solve it

Sample Question (teacher generated): Larry and Ralph sold 22 show tickets altogether. Larry sold 8 more tickets than Ralph. How many tickets did each boy sell?

Strategy:

1) UNDERSTAND: What do you need to find? You need to know that 22 tickets were sold in all. You also need to know that Larry sold 8 more than Ralph.

2) PLAN: How can you solve the problem? You can guess and check to find two numbers with a sum of 22 and a difference of 8. If your first guess does not work, try two different numbers.

3) SOLVE:

First Guess:

Larry = 14 tickets

Ralph = 8 tickets

Check

$$14 + 8 = 22$$

$$14 - 8 = 6 \text{ ( Larry sold 6 more tickets)}$$

These numbers do not work!

Second Guess:

Larry = 15 tickets

Ralph = 7 tickets

Check

$$15 + 7 = 22$$

$$15 - 7 = 8 \text{ ( Larry sold 8 more tickets)}$$

These numbers do work!

Larry sold 15 tickets and Ralph sold 7 tickets.

## Week 6

TV:

- 3 pairs who worked on the working backward presentation filmed their final presentation for distribution to grades 1 through 5. The students operated all filming equipment.
- 3 pairs shared their working guess and check and the class critiqued the performance using the rubric
- After the 3 pairs were critiqued they revised their presentation for final output

MATH:

- Discussed how to solve word problems by drawing pictures
- Students (in pairs) wrote their own drawing pictures word problems and wrote a script to teach how to solve it

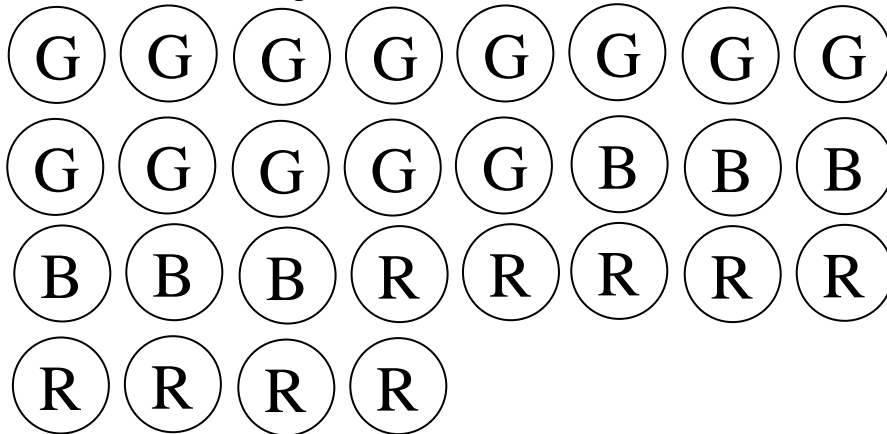
Sample Question (teacher generated): Gertrude has 13 green chips, 6 blue chips and 9 red chips in her bag. What fractional part of the bag of chips is green?

Strategy:

1) UNDERSTAND: What do you need to find? You need to find how many chips are in all. Then you need to find how many of the chips are green.

2) PLAN: How can you solve the problem? You can draw a picture to show the information. Then you can use the picture to find the answer.

3) SOLVE: Draw 28 chips.



13/28 of the chips are green.

### Week 7

TV:

- 3 pairs who worked on the guess and check presentation filmed their final presentation for distribution to grades 1 through 5. The students operated all filming equipment.
- 3 pairs shared their drawing pictures presentation and the class critiqued the performance using the rubric
- After the 3 pairs were critiqued they revised their presentation for final output

MATH:

- Discussed how to solve word problems by making a list
- Students (in pairs) wrote their own making a list word problem and wrote a script to teach how to solve it

Sample Question (teacher generated): Jane is taking pictures of Christy, Sandy and Mark. She asks them, " How many different ways could you three stand in a line?"

Strategy:

1) UNDERSTAND: What do you need to know? You need to know that any of the people can be first, second or third.

2) PLAN: How can you solve the problem? You can make a list to help you find all the different ways. Choose one person to be first, and another to be second. The last one will be third.

3) SOLVE: When you make your list, you will notice that there are 2 ways for Christy to be first, 2 ways for Sandy to be first and 2 ways for Mark to be first.

<u>First</u>	<u>Second</u>	<u>Third</u>
Christy	Sandy	Mark
Christy	Mark	Sandy
Sandy	Christy	Mark
Sandy	Mark	Christy
Mark	Sandy	Christy
Mark	Christy	Sandy

So, there are 6 ways that the children could stand in line.

### **Week 8**

TV:

- 3 pairs who worked on the drawing a picture presentation filmed their final presentation for distribution to grades 1 through 5. The students operated all filming equipment.
- 3 pairs shared their making a list presentation and the class critiqued the performance using the rubric
- After the 3 pairs were critiqued they revised their presentation for final output

MATH:

- Discussed how to solve word problems by writing a number sentence
- Students (in pairs) wrote their own writing a number sentence word problem and wrote a script to teach how to solve it

Sample Question (teacher generated): John put 117 pencils in 13 equal groups. How many pencils are in each group?

Strategy:

1) UNDERSTAND: What do you need to know? You need to know that there are 117 pencils and they are divided into 13 equal groups

2) PLAN: How can you solve the problem? You can write a number sentence to solve the problem. Write a division sentence to divide the pencils in 13 equal groups.

3) SOLVE:

$$117 \div 13 = 9$$

There are 9 pencils in each group.

## **Week 9**

### TV:

- 3 pairs who worked on the making a list presentation filmed their final presentation for distribution to grades 1 through 5. The students operated all filming equipment.
- 3 pairs shared their write a number sentence presentation and the class critiqued the performance using the rubric
- After the 3 pairs were critiqued they revised their presentation for final output

### MATH:

- Reviewed all strategies on how to solve word problems
- Students (in pairs) wrote their own word problem – any strategy- to be seen by the entire six grade

## **Week 10**

### TV:

- 3 pairs who worked on write a number sentence presentation filmed their final presentation for distribution to grades 1 through 5. The students operated all filming equipment.
- Sixth grade students watched LIVE the filming of the final strategy the pairs chose

## **Materials:**

Adobe Visual Communicator  
Microsoft PowerPoint  
White board  
White board markers  
Soft lights  
Green screen  
Sony Camera  
Boom microphone

## **Evaluation:**

- Teacher evaluation based on observation and rubric
- Student evaluation based on partner evaluations and self-evaluations using the rubric

From <http://mathstories.com/strategies.htm>

## Word Problems Solving Strategies with example problems

Find a Pattern
Make a Table
Work Backwards
Guess and Check
Draw a Picture
Make a List
Write a Number Sentence

Sample Question (Find a Pattern): Bill has written a number pattern that begins with 1, 4, 8, 13, 19. If he continues this pattern, what are the next four numbers in his pattern?

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Sample Question (Make a Table): You save \$7.45 on Monday. Each day after that you save twice as much as you saved the day before. If this pattern continues, how much would you save on Friday?

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Sample Question (Working Backwards): Lucy walked from Alton to Rochester. It took 1 hour 25 minutes to walk from Alton to Farmington. Then it took 40 minutes to walk from Farmington to Rochester. She arrived in Rochester at 5:45 P.M. At what time did she leave Alton?

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2) PLAN: How can you solve the problem? You can work backwards from the time Lucy reached Rochester. Subtract the time it took to walk from Farmington to Rochester. Then subtract the time it took to walk from Alton to Farmington.

3) SOLVE: Start at 5:45. This is the time Lucy reached Rochester. Subtract 40 minutes. This is the time it took to get from Rochester to Farmington. Time is: 5:05 P.M. Subtract: 1 hour 25 minutes. This is the time it took to get from Alton to Farmington. Lucy left Alton at 3:40 P.M.

Sample Question (Guess and Check): Larry and Ralph sold 22 show tickets altogether. Larry sold 8 more tickets than Ralph. How many tickets did each boy sell?

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These numbers do work!

Larry sold 15 tickets and Ralph sold 7 tickets.

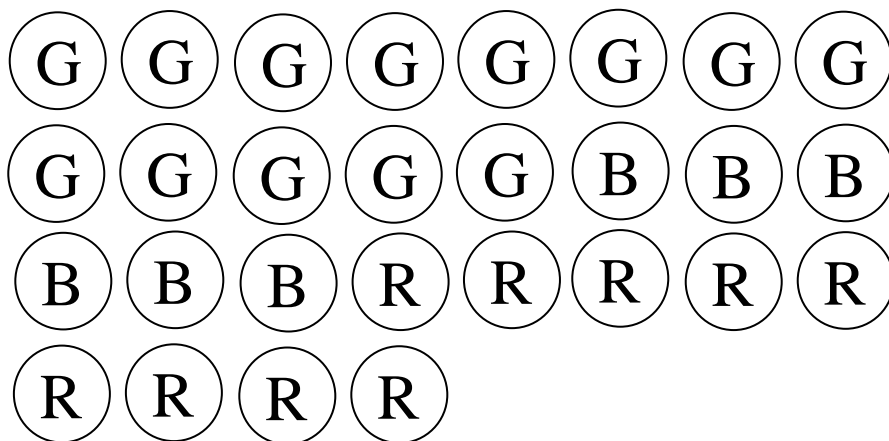
Sample Question (Drawing Pictures): Gertrude has 13 green chips, 6 blue chips and 9 red chips in her bag. What fractional part of the bag of chips is green?

Strategy:

1) UNDERSTAND: What do you need to find? You need to find how many chips are in all. Then you need to find how many of the chips are green.

2) PLAN: How can you solve the problem? You can draw a picture to show the information. Then you can use the picture to find the answer.

3) SOLVE: Draw 28 chips and label them with a “G” for green; “B” – blue; “R” - red



13/28 of the chips are green.

Sample Question (Making a List): Jane is taking pictures of Christy, Sandy and Mark. She asks them, " How many different ways could you three stand in a line?"

Strategy:

1) UNDERSTAND: What do you need to know? You need to know that any of the people can be first, second or third.

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Christy	Mark	Sandy
Sandy	Christy	Mark
Sandy	Mark	Christy
Mark	Sandy	Christy
Mark	Christy	Sandy

So, there are 6 ways that the children could stand in line.

Sample Question (Write a Number Sentence):  
John put 117 pencils in 13 equal groups. How many pencils are in each group?

Strategy:

1) UNDERSTAND: What do you need to know? You need to know that there are 117 pencils and they are divided into 13 equal groups

2) PLAN: How can you solve the problem? You can write a number sentence to solve the problem. Write a division sentence to divide the pencils in 13 equal groups.

3) SOLVE:

$$117 \div 13 = 9$$

There are 9 pencils in each group.

## Rubric for: Strategy Seekers

Teacher Name: **Mr. Wirth, Alton Central School - Enrichment Teacher**

Student Name: \_\_\_\_\_

CATEGORY	Advanced - 4	Proficient - 3	Basic - 2	Novice - 1
Mathematical Concepts	Student explanation shows complete understanding of the mathematical concepts used to solve the problem.	Student explanation shows substantial understanding of the mathematical concepts used to solve the problem.	Student explanation shows some understanding of the mathematical concepts needed to solve the problem.	Student explanation shows very limited understanding of the underlying concepts needed to solve the problem.
Word Problem Development	Student always uses an efficient and effective strategies to solve the problem. Uses complex and refined mathematical reasoning.	Student typically uses an effective strategy to solve the problem. Uses effective mathematical reasoning.	Student sometimes uses an effective strategy to solve problems, but does not do it consistently. Some evidence of mathematical	Student rarely uses an effective strategy to solve problems. Little evidence of mathematical reasoning.
Script Writing	Completely covers all required parts of the word problem providing many details and examples.	Covers all aspects of the of the word problem providing several details and examples.	Is missing some aspects of the word problem providing few details and examples.	Covers little of the word problem providing little or no details and examples.
Public Speaking	Sits or stands up straight, looks relaxed and confident. Establishes eye contact with the audience/camera during the presentation. Speaks clearly and distinctly	Sits or stands up straight and establishes eye contact most of the time during the presentation. Appears relaxed and confident. Can be heard by the audience.	Poor posture and/or does not look at audience/camera during most of the presentation. Sometimes cannot be heard by the audience.	Poor posture, no eye contact and cannot be heard.
Equipment	Consistently chooses to volunteer to use equipment and consistently uses them correctly and accurately	Usually chooses to volunteer to use equipment and usually uses them correctly and accurately	Sometimes chooses to volunteer to use equipment and sometimes uses them correctly and accurately	Rarely chooses to volunteer to use equipment and rarely uses them correctly and accurately
Attitude/Effort	Student always listens and follows directions and has an excellent attitude toward the project.	Student often listens and follows directions and has a good attitude toward the project.	Student sometimes listens and follows directions and has a fair attitude toward the project.	Student rarely listens and follows directions and has a poor attitude toward the project.