Daily Lesson
Mathematical Conjecture

1. Fred is looking for a number pattern in chart below.

Box 1	Box 2	Box 3	Box 4	Box 5
4	8	12	16	20
5	10	15	20	25

He wondered what number would go in the chart if the chart was extended to the 20th box.

a. Starting with Box 1, how do you get each number in the top row of numbers?

_____

b. How do you get each number in the bottom row *from the number in the top row*?

_____

c. What would be the two numbers in Box 20? On a separate sheet of paper, show how you came up with your answer.

Row 1: _____   Row 2: _____

2. Bill Gold and Lou Bach noticed these number patterns:

2 + 2 = 4	5 + 5 = 10	3 + 13 = 16
3 + 3 = 6	5 + 7 = 12	5 + 13 = 18
3 + 5 = 8	7 + 7 = 14	3 + 17 = 20

They saw that each of the sums were even numbers made by adding two prime numbers!

a. What are the prime numbers betweens 22 through 30?

_____ and _____

b. What is their sum? _____?

3. If any whole number is x and the formula is $2x$, what do all of the products have in common?

_____

Daily Lesson - continued

4. Johnny read 10 pages on Monday, 15 pages on Tuesday, 10 pages on Wednesday, 20 pages on Thursday, 10 pages on Friday, and 25 pages on Saturday. If this pattern continues, how many pages will Johnny read next Wednesday?

   _____ pages

5. Professor Holmes gives his students muffins every Monday.
   • The first week, the muffins were plain.
   • Then, he gave them muffins which each had 50 sprinkles.
   • The next week, each muffin had 100 sprinkles.
   • Each week he increased the number of sprinkles by 50.
   If 100 sprinkles weigh one ounce and a muffin can "hold" a half of a pound of sprinkles, how many weeks will a student get a muffin before there are too many sprinkles to fit on it?

   _____ weeks

6. Marta noticed that the sum of the angles of a right triangle add up to 180 degrees. She noticed that the sum of the angles of a rectangle is 360 degrees.
   a. What conclusion could she draw about the number of triangles that make up a rectangle?

   _____

7. Selena insists that it's possible for a line to intersect the center of a circle and not intersect any other part of the circle. Her math teacher agrees! How is this possible?

   _____

8. Sharika can jump halfway to the wall once she's within 10 feet of it. If she's 10 feet from the wall, how many jumps will it take her to get there?

   _____

Reteach Lesson
Mathematical Conjectures

Use the chart to answer the first four questions.

Box 1	Box 2	Box 3	Box 4	Box 5
3	8	13	18	23
5	10	15	20	25

1. What is the relationship between the number in the top row and the number below it?
   a. it's 2 greater
   b. it's 2 less
   c. no relation
   d. $2x - 4$

2. What is the relation of the number in the bottom row to the box number?
   a. it's 4 greater
   b. it's twice as big
   c. it's 5 times as big
   d. no relation

3. Which equation tells you what number is in the bottom row, if x is equal to the box number and N is equal to the number in the bottom row?
   a. $2x - 1 = N$
   b. $4x + x = N$
   c. $5x - x = N$
   d. $4 + x + x = N$

4. Which equation tells you what the number is in the top row, if x is equal to the box number and N is equal to the number in the top row?
   a. $3x - 2 = N$
   b. $4 + x - 2 = N$
   c. $5x - 2 = N$
   d. $5x + 2 = N$

5. Bailey felt like if he started with a long enough rope, he could keep cutting it half forever. Is he right? Explain.

_____

Reteach Lesson - continued

6. You multiply two even numbers.
   a. Would you get the same product if you double one and divided the other by 2 before you multiplied? Explain.

   _____

   b. Would it work the same way if one of the numbers is odd? Explain.

   _____

   c. Would it work the same way if both numbers were odd? Explain.

   _____

7. The sum of the angles of a triangle is 180 degrees. The sum of the angles of a quadrilateral is 360 degrees. The sum of the angles of a pentagon is 540 degrees. What is the sum of the angles of an octagon?

   _____ degrees

8. If your watch "lost" 5 minutes every 8 hours, and it's 1:00 p.m. now, what time would your watch say it is 48 hours from now?

   _____

9. There is a footbridge over a creek just outside of Harvey's cottage. It can support 100 pounds. Harvey currently weighs 90 pounds, but he's been gaining 4 ounces a week for the last year. How much did Harvey weigh a year ago?

   _____ pounds

10. To determine how far a person will travel you have to multiply the rate of travel and the time spent traveling. If Henry traveled only 25 miles in 10 hours and he was in a rocket ship, how is this possible?

   _____

Name:	Date:

F.L.I.P.S.

A **mathematical conjecture** is what we call a mathematical explanation before it has been proven or disproven. Look at the following five equations and, using complete sentences, write a mathematical conjecture explaining why each one is or is not correct. Draw a picture if you think that will help explain your conjecture!

1. $\frac{3}{4} = 0.34 = 75\%$

2. $\frac{7}{8} + \frac{6}{8} > 1$

3. If x is greater than 5, then x divided by 10 is greater than $\frac{1}{2}$.

4. 3 + 4 × 2 = 11

5. If 5y + 7 = 27, then y = 4

Home Connection
Mathematical Conjectures

Use the chart to answer the first four questions.

Box 1	Box 2	Box 3	Box 4	Box 5
6	11	16	21	26
10	15	20	25	30

1. What is the relationship between the number in the top row and the number below it?

   a. the top row is 4 less   b. top is 5 less

   c. no relation   d. top number is less than the bottom

2. What is the equation that would tell you what number is in the top row, if x is equal to the box number and N is equal to the number in the top row?

   a. $5x + 1$ b. $3x + 5$

   c. $6x - x$ d. $4x + 2$

3. What is the equation that would tell you what number is in the bottom row, if x is equal to the box number and N is equal to the number in the bottom row?

   a. $9x + 1 = N$ b. $4x + x = N$

   c. $5x + 5 = N$ d. $4 + x + x = N$

4. What number is in the bottom row in Box 15?

   a. 55   b. 60   c. 70   d. 80

5. If Larry could place 10 drops of water on a dime before water spilled, what would likely happen if he tried to place 12 drops of water on a nickel?

6. If there was an even number of beans in each can, what do you know about the number of beans in a case of 36 cans?

7. Suppose that H = 18, B = H + 4, Z = 2B + R, and R = ½H. What is the value of each variable?

8. Forsythe, Fleeble, and Flannery was the top law firm in Lawyer's Gulch. Forsythe had half the clients of Fleeble who had a fourth as many as Flannery. If Flannery was currently working with 40 clients, how many clients did Forsythe have?   _____ clients

9. Everyone knew that John could run faster than Sam. Ike was slower than Sam but defeated John every time they raced. How could this be possible?