2.1 Inductive Reasoning Day 1

Ever notice a rainbow after a rain storm?

Ever notice when street lights turn on?

Ever notice the wind kicks up before a major storm?

Have you ever done poorly on a test after failing to study for it?

Being able to recognize that these situations will occur is called **Inductive Reasoning!**
Geometry is rooted in inductive logic. We, as mathematicians, are always looking at patterns to make predictions. Historians do the same in the hopes that we won't make the same mistakes as prior civilizations.

Geometry, like much of science and mathematics, was developed partly as a result of people recognizing and describing patterns.

In this lesson, you will discover patterns yourself and use them to make predictions. Making predictions can help you analyze what is happening and what you can do about it, like stopping something bad, or helping something good.

Can you identify the next three letters in this pattern?

O, T, T, F, F, S, S, E, ...
Some important terms to know:

A **conjecture** is an unproven statement that is based on observations.

You use **inductive reasoning** when you find a pattern in specific cases and then write a conjecture for the general case.

A **counter example** is a specific case for which the conjecture is false.
Conjectures can be false too!

Jan: 15°  Jul: ___°
Feb: 24°  Aug: ___°
Mar: 39°  Sep: ___°
Apr: 49°  Oct: ___°
May: 58°  Nov: ___°
Jun: 72°  Dec: ___°
Example: Draw the next picture:

First, figure out what is happening...
Example: Describe the pattern in the numbers and then write the next three.

-7, -21, -63, -189, ...

How are these numbers changing?

\[ x_3 \]

-567, -1701, -5103
Let's try an example where we make a conjecture:

The NCAA Tournament allows 68 teams to play in the men's basketball tournament. This is from a standard 64 team draw plus the bottom 8 seeds play in 4 "play in games" to the tournament. How many total games will be played in the tournament?

Let's look for a pattern in a standard draw!
4 team tournament: Team A, B, C, D
1st Round:  A vs B    C vs D  2 games
2nd Round:  Winner vs  Winner  1 game
            ___ games

Make a conjecture:
4 teams = ____ games + 4 "Play in games" = _____ games
8 team tournament: Team A, B, C, D, E, F, G, H
1st Round: A vs B   C vs D   E vs F   G vs H  4 games
2nd Round: Winner vs Winner   Winner vs Winner  2 games
3rd Round: Winner vs Winner  1 game

Make a conjecture:
8 teams = _____ games + 4 "Play in games" = _____ games
The NCAA Tournament allows 68 teams to play in the men's basketball tournament. This is from a standard 64 team draw plus the bottom 8 seeds play in 4 "play in games" to the tournament.

How many total games will be played in the tournament?

**Make a conjecture:**

64 teams = _____ games + 4 "Play in games" = ______ games
How many squares are in the next 3 objects?
Assignment:
Page 67: 1-13, 22, 32