1.1 Make a Conjectures: Inductive Reasoning

Example 1: A Math class consists of 20 boys and 10 girls. Can a conjecture be made about the composition of the school? Can you make mora than one conjecture?

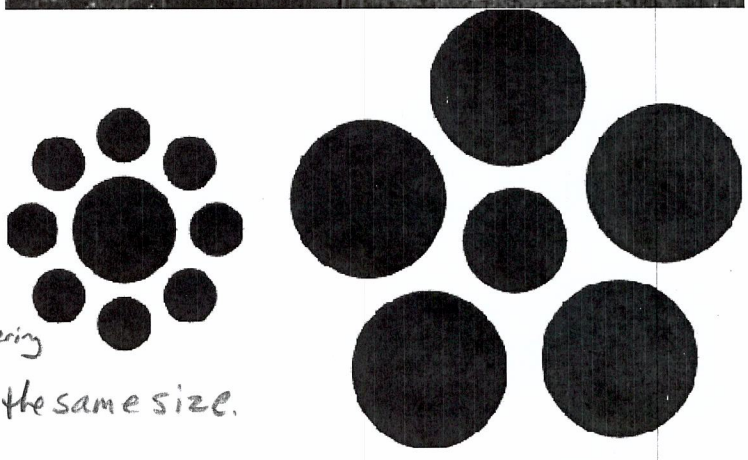
① There are more boys than girls in the school
② There are twice as many boys as girls in the school

Example 2: Develop at least three conjectures about what

Is happening in this photograph.

- She is waiting for a bus/ride
- She is painting a scenic view.
- She is running away

Example3: Make a conjecture about the circles in the centre.



Conjecture: The left figure has a larger inner circle

"How could you strengthen your conjecture?"
- measure the diameter of each circle

"Do we need to revise our conjecture after discovering more evidence?"
- The inner circles of each figure are the same size.

Conjecture: An opinion or conclusion that is based on available evidence but is not yet proven.

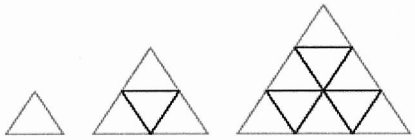
- The more examples you have to support your conjecture the stronger the conjecture is. Examples alone can never prove a conjecture since we cannot try ALL examples.

- It may be revised, based on new evidence. Some conjectures may initially seem to be true, but are shown not to be valid after more evidence is gathered.

To Build Evidence: a) provide a minimum of 3 examples.
b) look for a consistent pattern, draw a conclusion.

Example 3: Consider the following pattern of equilateral triangles. Georgia made a conjecture that the 20th figure will have 400 triangles.

Figure: 1 2 3



How did Georgia arrive at this conjecture?

Figure	1	2	3	4	5	6	7
# Triangles	1	4	9	16	25	36	49

With a partner, discuss what you notice about the data in the table. What numeric pattern do you see in the table? (Figure #)^2

Is Georgia's conjecture reasonable? Yes.

Inductive Reasoning: Drawing a general conclusion from collecting evidence, observing patterns and identifying properties in specific examples.

How did Georgia use **inductive reasoning** to develop her conjecture?

She used examples to find a pattern

Is there a different conjecture you could make based upon the pattern you see? Explain.

# of triangles +3, +5, +7, +9, +11 . . .

Example4: **Using Inductive Reasoning to Develop a Conjecture about Integers**

Make a conjecture about the product of two EVEN integers.

Example of product of **two positive** even integers: $(2)(4) = 8$

Example of product of **two negative** even integers: $(-2)(-6) = 12$

Example of product of **one positive and one negative** even integer: $(-4)(+10) = -40$

My conjecture is The product of two even #'s will always be even.

Example 5: Using Inductive Reasoning to Develop a Conjecture about Perfect Squares

What is a perfect square number? Something that can be perfectly square rooted($\sqrt{}$)
- A # that has two of the exact same factors

Examples of perfect square number:

1, 4, 9, 16, 25...

Make a conjecture about the DIFFERENCE between CONSECUTIVE perfect squares.

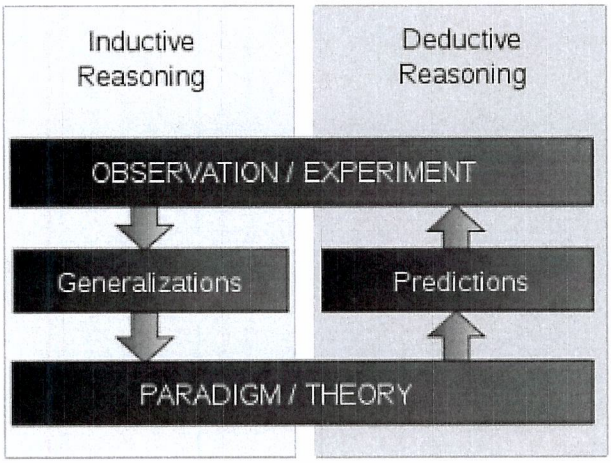
Example $4-1=3$

Example $16-9=7$

Example $100-81=19$

My conjecture is the difference between consecutive perfect squares will result in an odd #.

1.1 Assignment Pg 12 # 1-3, 5, 7, 9-11 and 20



In Summary

Key Idea

- Inductive reasoning involves looking at specific examples. By observing patterns and identifying properties in these examples, you may be able to make a general conclusion, which you can state as a conjecture.

Need to Know

- A conjecture is based on evidence you have gathered.
- More support for a conjecture strengthens the conjecture, but does not prove it.