Name **Key**   Date_____   Pd_____

2.2 Inductive and Deductive Reasoning CYU

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Inductive Reasoning	1, 2, 13	3, 4, 10 - 12	5, 6
Deductive Reasoning	7 – 9, 14	10 - 12	
Conjecture	1, 2	3 - 6	15 - 16
Counterexample		17 - 18	

1 – 2: Use inductive reasoning to draw the next picture.

1.

2.

← 16
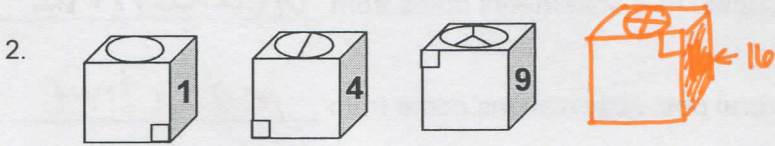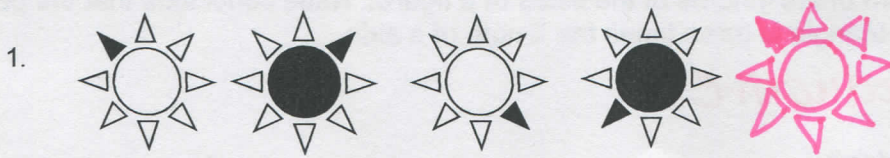
3 – 4: Use inductive reasoning to find the next two terms.

3. 5, 6, 8, 11, 15, __20__, __26__   +1 +2 +3

4. 1, 3, 4, 7, 11, 18, __29__, __47__   sum of 2 previous terms

5 – 6: Do the following.

5. Write the equation that the pattern indicates should come next.

$$1 \times 9 + 2 = 11$$
$$12 \times 9 + 3 = 111$$
$$123 \times 9 + 4 = 1111$$
$$1234 \times 9 + 5 = 11111$$

6. Every day for the past 5 days, we learned and had fun in Geometry. Make a conjecture.

the next 5 days we will learn & have fun in Geometry

7 – 9: Use deductive reasoning to solve the following.

7. If the temperature falls below 32 degrees, then it is a fact that water will freeze. The temperature today was 19 degrees. Will the water freeze? *yes*

8. Jan is older than Carol, but Jan is younger than Lee. Who is the oldest of the three? *Lee*

	T	D	L
Joe	X	X	O
John	O	X	X
Jerry	X	O	X

9. Joe, John, and Jerry are friends. One is a teacher, one is a doctor, and one is a lawyer. John hired the lawyer to look into a business venture with him. Joe invited the doctor and his wife over for dinner but did not invite John. Jerry says he does not have the patience to be a teacher. State the occupation of each friend.

Joe → Lawyer; John → teacher; Jerry → Doctor

10 – 12: Tell whether the reasoning process used is deductive, inductive, or neither.

10. After picking marigolds for the first time, Connie began to sneeze. She also began sneezing the next four times she was near marigolds. Connie reasons that she is allergic to marigolds.

inductive

11. Walking down the street one sunny afternoon, Laura concludes that it is going to be a great day.

neither

12. By using the definition of an equilateral triangle (a triangle with 3 congruent sides) and of perimeter (the sum of the lengths of the sides of a figure), Katie concludes that the perimeter of every equilateral triangle is three times the length of a side.

deductive

13 – 14: Fill in the blank.

13. Conclusions based on accepted true statements come from __*deductive*__ reasoning.

14. Conclusions based on several past observations come from __*inductive*__ reasoning.

15 – 16: Make and test a conjecture about the given quantity.

15. the product of any two even integers.

even integer: (sample) $-2(4) = -8$ $6(12) = 72$ $8(10) = 80$

16. the quotient of a number and its reciprocal.

is the square of that #: (sample) $9 \div \frac{1}{9} = 9 \cdot 9 = 9^2$ $\frac{2}{3} \div \frac{3}{2} = \frac{2}{3} \cdot \frac{2}{3} = \left(\frac{2}{3}\right)^2$

17 – 18: Find a counterexample to show that the conjecture is false.

17. The product of two positive numbers is always greater than either number.

sample answer: $1 \cdot 5 = 5$ $5 \ngtr 5$

18. If two angles are supplements of each other, then one of the angles must be acute.

they could both be right ∠'s. Then neither is acute.

CYU Reflection: *How far can you go: basic, intermediate, or advanced?*
Rate your mastery level!
How confident are you with the skills this CYU covered? Circle the score you would give yourself.

1	2	3	4	5	6	7	8
Basic		Intermediate			Advanced		Solved ALL!