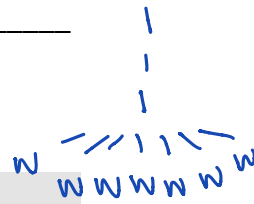


Name: _____

Date: _____

Consider this old rhyme that can be traced back to 1730:



Poem - As I was going to St. Ives

As I was going to St. Ives I met a man with seven wives,
 Each wife had seven sacks, each sack had seven cats,
 Each cat had seven kits: kits, cats, sacks and wives,
 How many were going to St. Ives?

St. Ives is an old village near Cornwall, England.

How many were going to St. Ives?

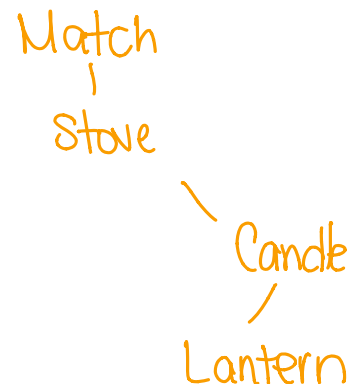
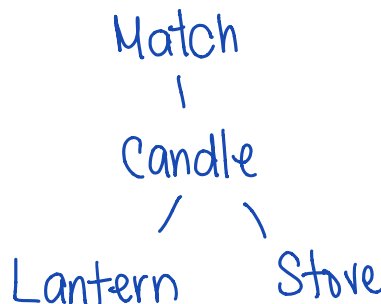
✓ 55 2802 343 154 2752
 112 2 2403 2404

We use reasoning to solve problems. We can use:

Inductive Reasoning	Deductive Reasoning
<ul style="list-style-type: none"> - we can't prove these. - write a few examples <ul style="list-style-type: none"> - form a conjecture. - pattern formation 	<ul style="list-style-type: none"> - drawing conclusions from facts. - Sherlock.

Example Suppose you were lost in the woods and came upon a cabin. In the cabin there was a lantern, candle, wood stove (with wood) and a match. In what order to you light things? Which kind of reasoning did you use?

1. Match
2. Candle
3. Lantern
4. Stove.



Induction - conjectures

Example Find the next two rows in the pattern:

a) $12345679 \times 9 \times 1 = 111111111$
 $12345679 \times 9 \times 2 = 222222222$
 $12345679 \times 9 \times 3 = 333333333$
 $12345679 \times 9 \times 4 = 444444444$
 $12345679 \times 9 \times 5 = 555555555$

$12345679 \times 9 \times 6 = 666666666$
 $12345679 \times 9 \times 7 = 777777777$

b) $1^2 = 1 = 1$
 $2^2 = 4 = 1 + 3$
 $3^2 = 9 = 1 + 3 + 5$
 $4^2 = 16 = 1 + 3 + 5 + 7$

$5^2 = 25 = 1 + 3 + 5 + 7 + 9$
 $6^2 = 36 = 1 + 3 + 5 + 7 + 9 + 11$

What kind of reasoning did you use?

Induction - pattern finding

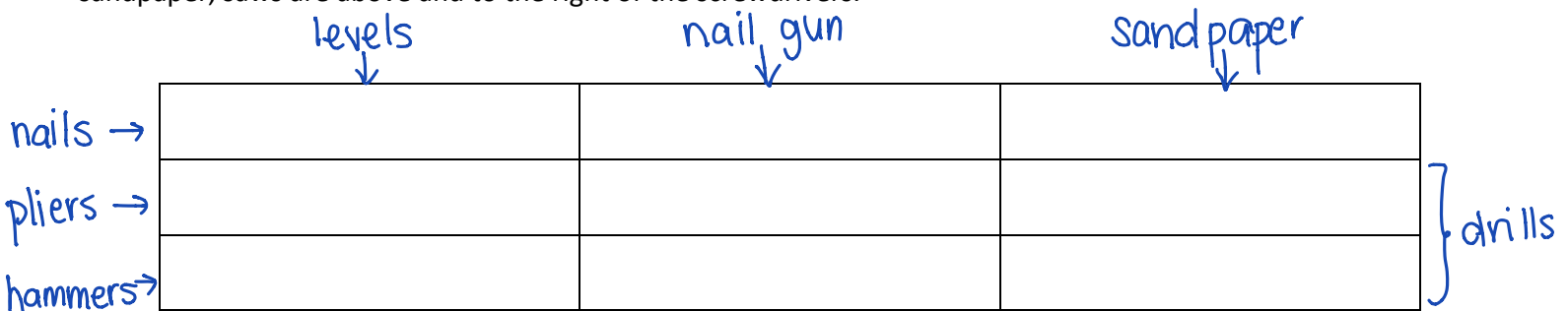
Example Use the information and the chart below to determine the record age for each animal.

- The sea anemone lives longer than 85 years.
- The two-legged animal lives 62 years.
- The tortoise lives longer than the elephant and ostrich.
- The goldfish has the shortest life.
- The blue whale did not live as long as the ostrich.
- The tortoise lives longer than the sea anemone.

	41	45	62	81	90	152
Elephant	41	45	62	X	90	152
Blue Whale	41	X	62	81	90	152
Goldfish	X	45	62	81	90	152
Ostrich	41	45	X	81	90	152
Sea Anemone	41	45	62	81	X	152
Tortoise	41	45	62	81	90	X

Deduction - using facts to draw conclusions

Example Mr. Henning uses a cabinet to organize his tools. He puts his nails in the top row, hammers in the bottom row and pliers in the middle row, each in a different column. Levels are in the left column, sandpaper is in the right column and the nail gun is in the middle column. Drills are just below the sandpaper, saws are above and to the right of the screwdrivers.



Is there more than one solution to the problem? *yes.*

Deduction - making decisions based on facts.