1.2/1.3 Exploring the Validity of Conjectures – Looking for Counterexamples

Curricular Competencies:

I can think creatively with curiosity and wonder

I can apply flexible and strategic approaches to problems

I can reflect on math thinking

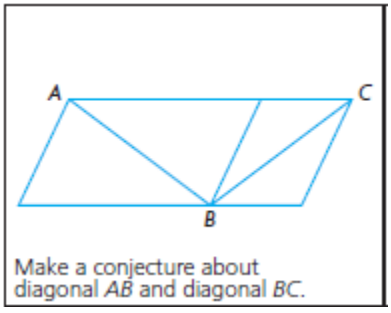
Conjectures can readily be made but to become valid: we need to provide evidence and not find an example that makes it false

It takes only one counterexample to disprove a conjecture.

Counterexample an example that goes against the stated pattern or conjecture.

Once a conjecture is disproved it must be revised to accommodate the new information.

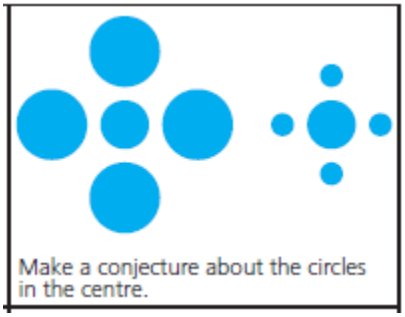
Ex:



Make a conjecture about diagonal *AB* and diagonal *BC*.

AB is longer than BC

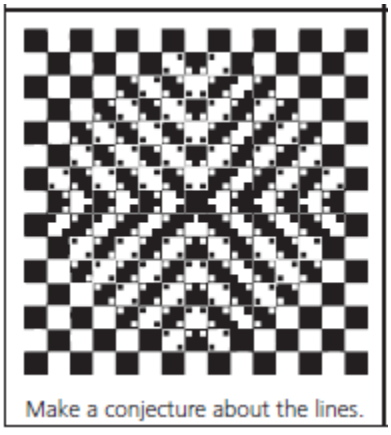
-measure to test.



Make a conjecture about the circles in the centre.

the circles are the same size

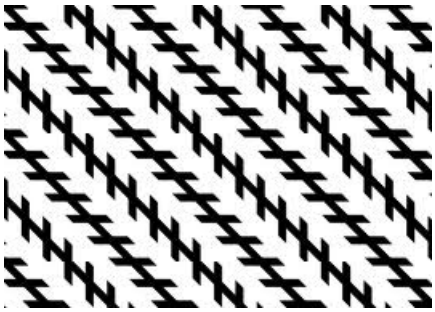
-measure them



Make a conjecture about the lines.

the lines are straight

-use a ruler to make sure.



Make a conjecture about the lines

the lines are not parallel

-measure with protractor

Conjecture: All but one of the vowels (a,e,i,o,u,and y) are used to spell numbers. Gather evidence to support or deny this conjecture.

Support

four
eight
fifty

counterexample?

one thousand

Ex. Matt found an interesting numeric pattern:

1 * 8 + 1 = 9

12 * 8 + 2 = 98

123 * 8 + 3 = 987

1234 * 8 + 4 = 9876

Matt thinks that this pattern will continue. Search for a counterexample to Matt's conjecture.

$12345 \times 8 + 5 = 98765$ ✓

$123456789 \times 8 + 9 = 987\ 654\ 321$ ✓

$1234567891 0 \times 8 + 10 = 98\ 76543\ 129$ X

$12345678910 \times 8 + 10 = 987\ 654\ 3130$ X

Revise the conjecture to make it valid

The pattern will continue until you reach 10.

Practice: pg 17 # 2,3

pg 22 # 1, 3, 5, 6, 9, 12, 14, 16, 17