Spider Math
One little, two little, Three little spiders...

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## Name: -n-n-n-n Date:

## PATTERNS

The Very Busy Spider Patterns

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What comes next?
Cut out the spider and sheep pictures. Say the pattern together, and then continue the pattern by gluing the pictures on the board.
http://www.learningtreasures.com/suite101/literature/busy_spider_patte rnsl.jpg

Name: $\qquad$ Date: $\qquad$
Spider Web Angles Spider Search


Find the angles. Use your protractor to measure the degrees. Color the angles as indicated by outlining them.


## Symmetry

Many plants and animals have symmetry. Symmetry means that if you fold the animal or plant along an imaginary line, both sides will match. If you bend down at your waist, you do not match. You do not have symmetry between your head and your feet.

Spiders have mirror image symmetry. This is also called bi-lateral symmetry, which means left/right symmetry.


VERSION 1: Teacher should prepare a "half spider." Show students that a mirror put on the lateral line will make a symmetrical spider. Now have the students finish the spider.

VERSION 2: Have each student take a piece of graph paper. It may be easier if the student folds the paper down the middle. Now the student should draw half a spider.

Remind them that a half spider has half of a cephalothorax and half an abdomen, and a half spider will only have four legs, one fang, one pedipalp, and one to 4 eyes.

When the half spiders are done, students should exchange papers and have another student add the other side to give it perfect symmetry. You may want to show them what that would look like by putting a mirror on the lateral line.

Name: $\qquad$ Date: $\qquad$

## Spider Paths

How many ways can the spider take to the web? Using colored pencils and only STRAIGHT lines, jump from object to object. You may go diagonal. USE a ruler. But remember, this is NOT a maze. You must touch an object on each jump.

Compare the number of paths you found with a partner. Who had more?

* MATH Genius challenge: Is there a formula or mathematical way you could find out how many paths are possible? What if it was a $3 \times 3$ grid or a $5 \times 5$ grid?


Start:


How many spider paths did you find? $\qquad$

Spiders have 8 legs and ladybugs have 6 legs. Write and solve an equation to give the total number of legs. Also give the number of heads.

| $\begin{array}{ll} x & x \\ 0 & 0 \\ \# 1 & 0 \\ \# 1 \end{array}$ | \#2 |  | $\begin{aligned} & x \rightarrow \\ & x+6 \\ & 6 * \\ & \ldots 4 \\ & \# 4 \end{aligned}$ |
| :---: | :---: | :---: | :---: |
|  | $* *$ <br> \#6 |  | $\begin{array}{ll} x & x \\ \rightarrow & 6 \\ 6 & \\ 3 & \\ \# 8 \end{array}$ |
| $\begin{aligned} & 606 \\ & x \rightarrow 6 \\ & \rightarrow \rightarrow \end{aligned}$ <br> \#9 | \#10 |  | - <br> \#12 |
| $\begin{aligned} & x+1 \\ & \rightarrow+ \\ & \rightarrow+6 \\ & \rightarrow 6 * \end{aligned}$ <br> \#13 |  | \#15 | $\begin{aligned} & \theta \theta \theta \\ & \theta \theta 大 \theta \end{aligned}$ |

## Spider Algebra

 Answer Key\#1: 2 spiders +3 bugs $=\mathrm{L}$

$$
\begin{aligned}
& 2(8)+3(6)=16+18=34 \text { legs } \\
& 5 \text { heads }
\end{aligned}
$$

\#2: 2 bugs +1 spider $=\mathrm{L}$

$$
\begin{aligned}
& 2(6)+1(8)=12+8=20 \text { legs } \\
& 3 \text { heads }
\end{aligned}
$$

\#3: 4 spiders +3 bugs $=L$

$$
\begin{aligned}
& 4(8)+3(6)=32+18=50 \text { legs } \\
& 7 \text { heads }
\end{aligned}
$$

\#4: 4 spiders +4 bugs $=L$
$4(8)+4(6)=32+24=56$ legs 8 heads
\#5: 8 bugs +1 spider $=L$
$8(6)+1(8)=48+8=56$ legs 9 heads
\#6: 2 spiders +2 bugs $=L$

$$
2(8)+2(6)=16+12=28 \text { legs }
$$ 4 heads

\#7: 1 spider +8 bugs $=L$
$1(8)+8(6)=8+48=56$ legs 9 heads
\#8: 3 spiders +3 bugs $=L$

$$
3(8)+3(6)=24+18=42 \text { legs }
$$ 6 heads


\#9: 4 bugs +4 spiders $=L$
$4(6)+4(8)=24+32=56$ legs 8 heads
\#10: 5 spiders +2 bugs $=\mathrm{L}$ $5(8)+2(6)=40+12+52$ legs 7 heads
\#11: 8 spiders $=\mathrm{L}$
$8(8)=64$ legs
8 heads
\#12: 2 bugs = L
$2(6)=12$ legs 2 heads
\#13: 6 spiders +5 bugs $=\mathrm{L}$
$6(8)+5(6)=48+30=78$ legs 11 heads
\#14: 11 spiders +7 bugs $=\mathrm{L}$
$11(8)+7(6)=88+42=130$ legs 18 heads
\#15: 2 spiders +8 bugs $=\mathrm{L}$ $2(8)+8(6)=16+48=64$ legs 10 heads
\#16: 9 bugs $=\mathrm{L}$

$$
9(6)=54 \text { legs }
$$

9 heads

Name: $\qquad$ Date: $\qquad$
Spider Algebra Reversed
Use sketches until you can find a pattern to solve these problems:


Insect 8 Spider Problems



for Spider Algebra Reversed

| Insects \& Spiders-1 | Insects \& Spiders-2 |
| :---: | :---: |
| 7 heads | 5 heads |
| 48 legs | 40 legs |
| Answer: 4 insects, 3 spiders | Answer: 0 insects, 5 spiders |
| Insects \& Spiders-3 | Insects \& Spiders-4 |
| 10 heads | 12 heads |
| 72 legs | 80 legs |
| Answer: 4 insects, 6 spiders | Answer: 8 insects, 4 spiders |
| Insects \& Spiders-5 | Insects \& Spiders-6 |
| 20 heads | 9 heads |
| 124 legs | 62 legs |
| Answer: 18 insects, 2 spiders | Answer: 5 insects, 4 spiders |
| Insects \& Spiders-7 | Insects \& Spiders-8 |
| 6 heads | 8 heads |
| 40 legs | 56 legs |
| Answer: 4 insects, 2 spiders | Answer: 4 insects, 4 spiders |
| Insects \& Spiders-9 | Insects \& Spiders-10 |
| 4 heads | 11 heads |
| 30 legs | 76 legs |
| Answer: 1 insect, 3 spiders | Answer: 6 insects, 5 spiders |


| Insects \& Spiders- 11 <br> 7 heads <br> 52 legs <br> Answer: 2 insects, 5 spiders | Insects \& Spiders- 12 <br> $\mathbf{5}$ heads <br> $\mathbf{3 6}$ legs <br> Answer: 2 insects, 3 spiders |
| :---: | :---: |
| Insects \& Spiders- 13 <br> $\mathbf{1 0}$ heads <br> $\mathbf{6 4}$ legs <br> Answer: 8 insects, 2 spiders | Insects \& Spiders- 14 $\mathbf{1 2}$ heads 90 legs Answer: 3 insects, 9 spiders |
| $\left\lvert\, \begin{array}{c\|} \hline \text { Insects \& Spiders- } 15 \\ 20 \text { heads } \\ 150 \text { legs } \\ \text { Answer: } 5 \text { insects, } 15 \text { spiders } \end{array}\right.$ | Insects \& Spiders- 16 9 heads 56 legs Answer: 8 insects, 1 spider |
|  <br>  <br>  <br> $\mathbf{6}$ heads <br> $\mathbf{4 4}$ legs <br> Answer: <br> 2 insects, 4 spiders | $\begin{gathered} \text { Insects \& Spiders- } 18 \\ \mathbf{8} \text { heads } \\ \mathbf{6 0} \text { legs } \\ \text { Answer: } 2 \text { insects, } 6 \text { spiders } \end{gathered}$ |
| Insects \& Spiders-19 <br>  <br> 4 heads <br> 26 legs <br> Answer: 3 insects, 1 spider | Insects \& Spiders- 20 $\mathbf{1 1}$ heads $\mathbf{8 2}$ legs Answer: 3 insects, 8 spiders |



## Spider Coordinates



Label a coordinate grid. You can use one to four quadrants, depending on the age of the students.

VERSION 1: Teacher draws the spider some place on the grid, and students make a list of ordered pairs where the spider is located.

VERSION 2: Teacher gives a list of ordered pairs and students place them on a grid. Then students connect the dots.

## Spider Web Area and Perimeter

On the following graph paper, draw a spider web with 5 to 8 sides. Keep all lines straight and if they cross a square put them from corner to corner. Assume that each side is 1 unit. Find the perimeter and the area and then explain HOW you found them. There is more than one way!

## Counting by Bs.



Buy a lot of plastic spiders. Have younger students count the legs on one.
Then fill in this chart with the number of legs.

|  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |
| One | Two | Three | Four | Five | Six | Seven | Eight | Nine | Ten |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Name: $\qquad$ Date: $\qquad$

## Spider Legs Multiplying

Fill in this chart with the number of legs on spiders

|  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | 48 |  |  |  |  |
| One | Two | Three | Four | Five | Six | Seven | Eight | Nine | Ten |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

1. 3 spiders have $\qquad$ legs.
2. 5 spiders have $\qquad$ legs.
3. 2 spiders have $\qquad$ legs.
4. 9 spiders have $\qquad$ legs.
5. 7 spiders have $\qquad$ legs.
6. 1 spider has $\qquad$ legs.
7. 4 spiders have $\qquad$ legs.
8. 6 spiders have $\qquad$ legs.
9. 8 spiders have $\qquad$ legs.

## Adding Spider Legs

1. 2 spiders +1 spider have $\qquad$ legs.
2. 3 spiders +2 spiders have $\qquad$ legs.
3. 5 spiders +4 spiders have $\qquad$ legs.
4. 2 spiders +2 spiders have $\qquad$ legs.
5. 6 spiders +8 spiders have $\qquad$ legs.

Name: $\qquad$
How Many Spiders?
Count the number of spiders and put the number on the line.
1.

$\qquad$
2.

3.

4.

$\qquad$
5.

$\qquad$
6.

7.

$\qquad$
8.

$\qquad$

$\qquad$


