TURTLE 301 SQUARE

start
repeat   4
forward   150
right   90

How easy was that?

- Change the size of the square.
- See if you can use the repeat command to add a triangle on top of the square.
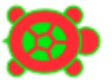
TURTLE 302 GROWING SQUARES

start
repeat   4
forward   50
right   90
repeat   4
forward   100
right   90
repeat   4
forward   150
right   90
repeat   4
forward   200
right   90
repeat   4
forward   250
right   90

- See if you can add two more squares. Continue the pattern when you increase the size of each new square.
- Try to make the pattern again going to the left.

Turtle 303   Rectangle

start

repeat   2

forward   150

right   90

forward   300

right   90

Did you know that the correct name for this is OBLONG.

A square and an oblong can both be called a rectangle.

- Make a bigger rectangle or a smaller rectangle.
- Change the dimensions of the rectangle.

Turtle 304   Triangle Pattern

start
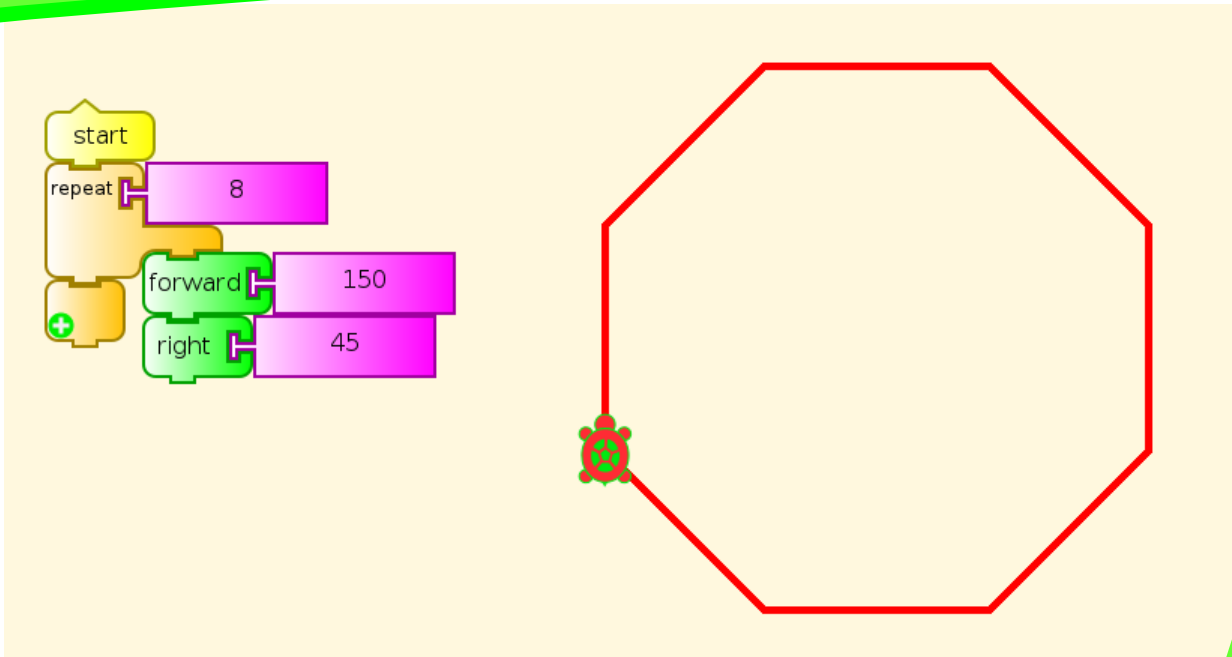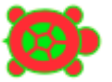
repeat   5

forward   220

right   135

forward   150

right   90

forward   150

right   60

- Change the size of the triangles.
- See if you can change the angles in the triangles.
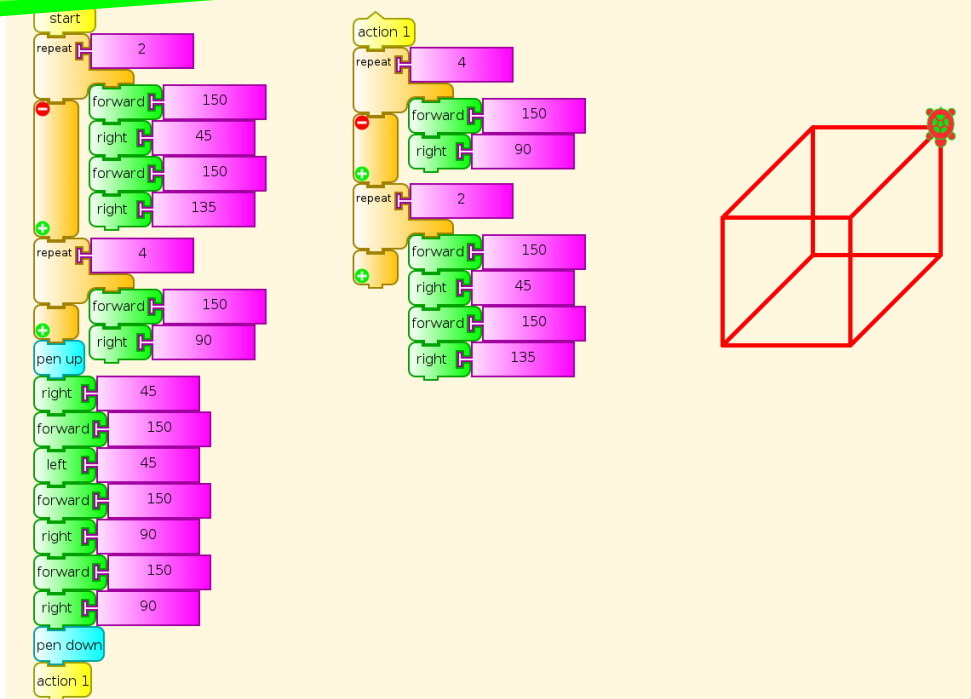 You might also need to change the number of repeats.

Turtle 305 Octagon

start

repeat ⊢ 8

forward ⊢ 150

right ⊢ 45

- Change the size of the octagon.
- What happens if you change the angle by making it smaller or larger? Can you make a closed shape again?

Turtle 306 Prism or Cube

start

repeat ⊢ 2

forward ⊢ 150
right ⊢ 45
forward ⊢ 150
right ⊢ 135

repeat ⊢ 4

forward ⊢ 150
right ⊢ 90

pen up
right ⊢ 45
forward ⊢ 150
left ⊢ 45
forward ⊢ 150
right ⊢ 90
forward ⊢ 150
right ⊢ 90
pen down
action 1

action 1

repeat ⊢ 4

forward ⊢ 150
right ⊢ 90

repeat ⊢ 2

forward ⊢ 150
right ⊢ 45
forward ⊢ 150
right ⊢ 135

- See if you can make another prism with an oblong face.
- Change some of the other dimensions to see what you can create.

Turtle 307 Pentagon
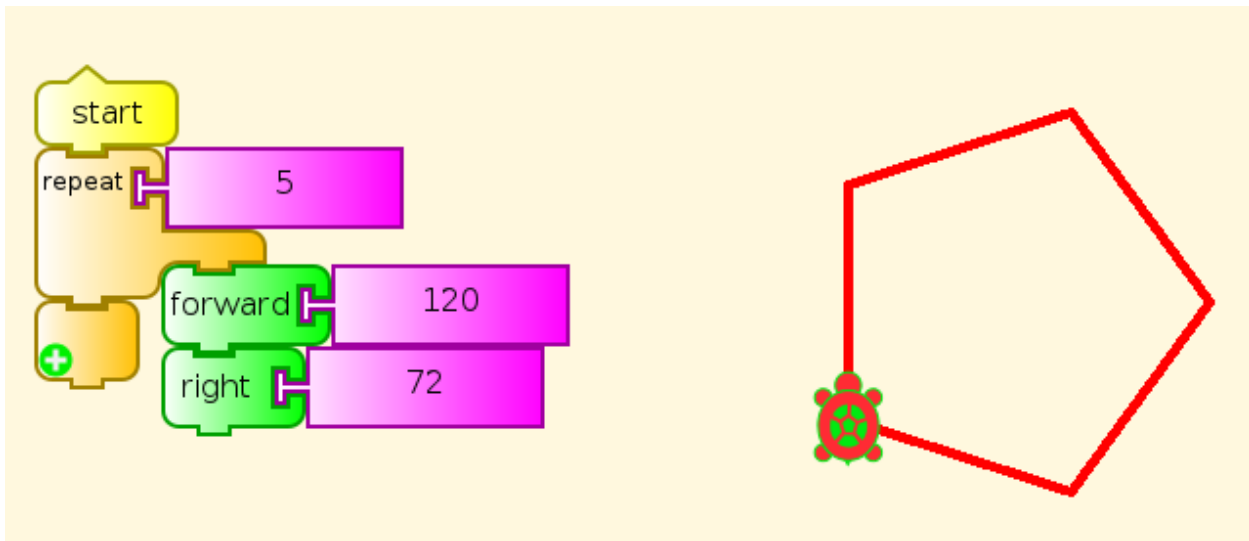
```
start
repeat        5
    forward      120
    right        72
```
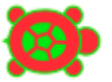
- Make a larger pentagon.
- Can you make a pentagon with a flat base line?
- What happens if you change the angle?

Turtle 308 Triangle Pyramid
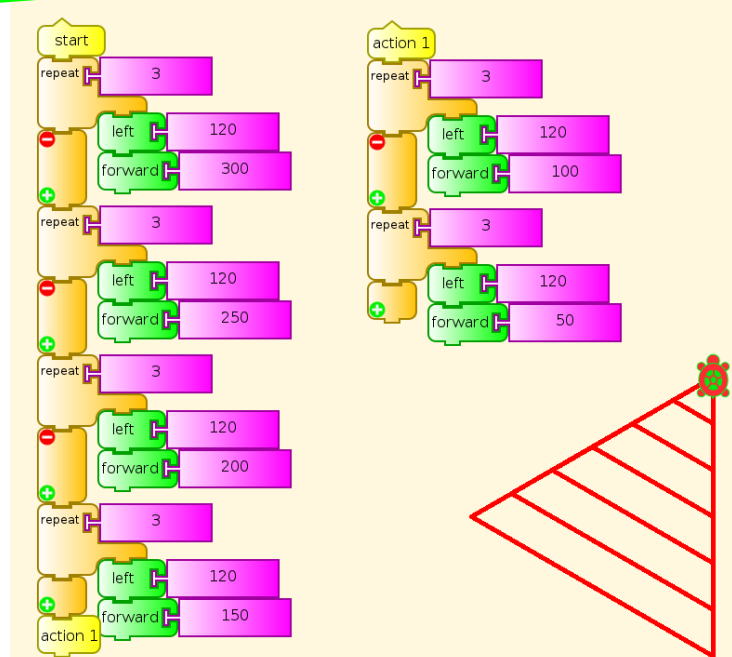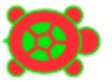
```
start
repeat        3
    left        120
    forward     300
repeat        3
    left        120
    forward     250
repeat        3
    left        120
    forward     200
repeat        3
    left        120
    forward     150
action 1
```

```
action 1
repeat        3
    left        120
    forward     100
repeat        3
    left        120
    forward     50
```

- Can you make another pyramid like this with larger triangles?
- Can you make it so the base line is flat (not on an angle)?
- Draw a star or a flag on top of the pyramid.
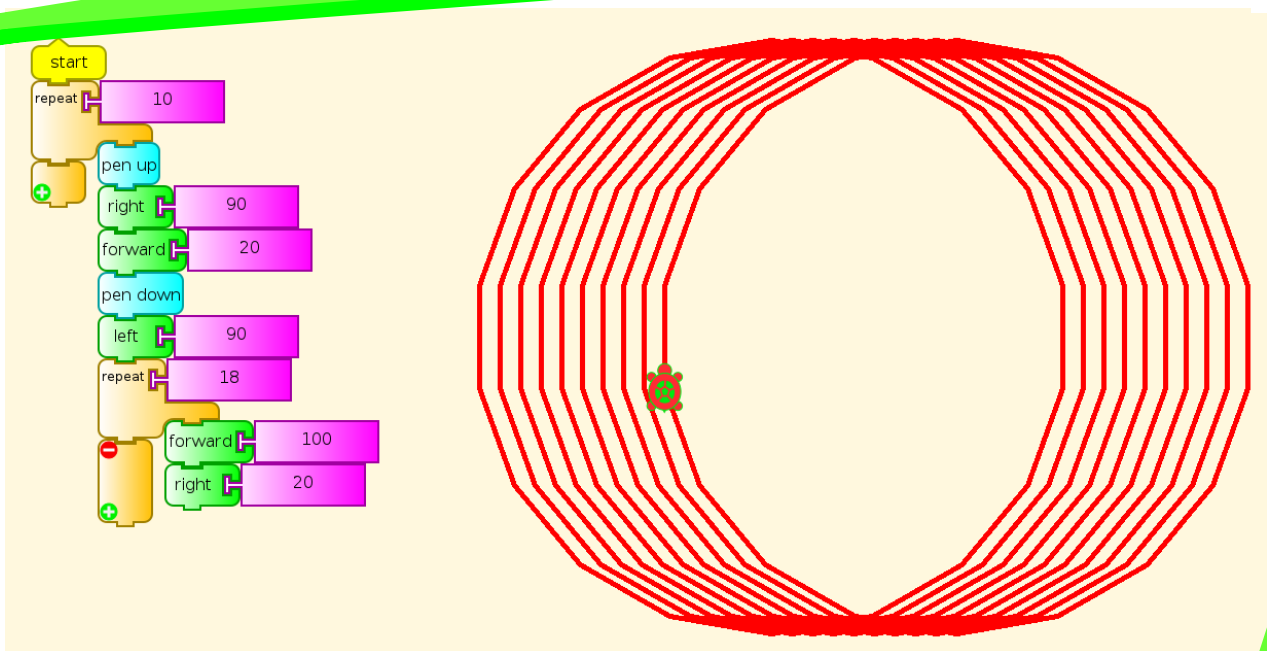
Turtle 309 Pentagon 2

start

left | 90

repeat | 5

forward | 150

right | 72
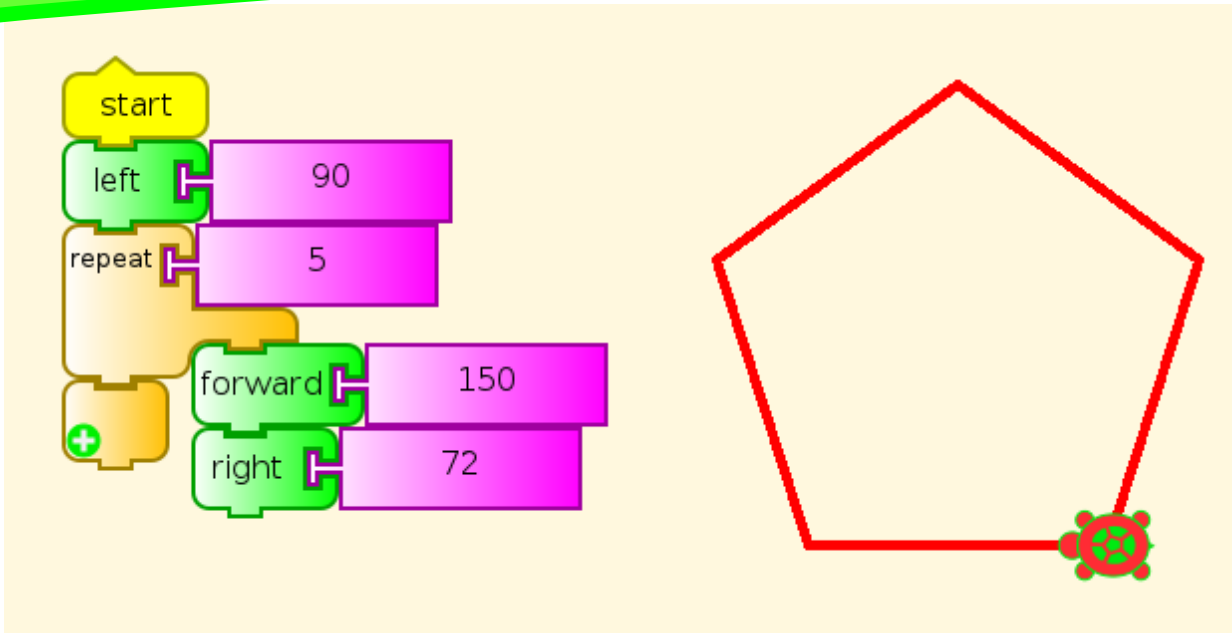
- See if you can use the pen up and down commands to create a face inside the pentagon.
- Try to draw some legs on the pentagon.
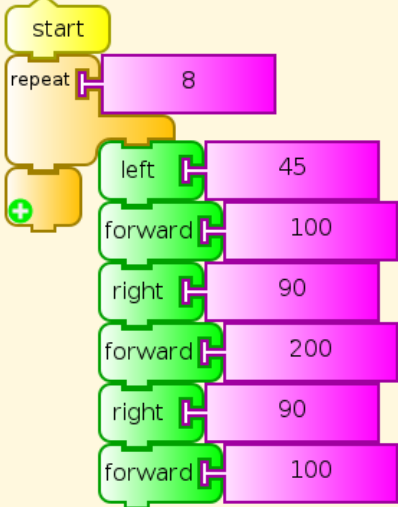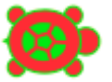
Turtle 310 Necklace

start

repeat | 10

pen up

right | 90

forward | 20

pen down

left | 90

repeat | 18

forward | 100

right | 20
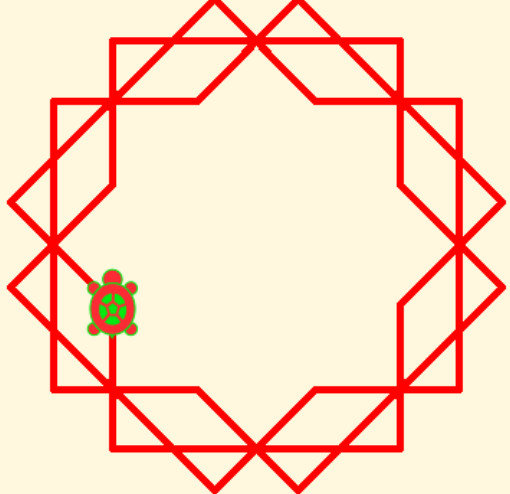
- Create different types of necklaces.
- Can you create something special on the necklace like a cross or a star?

Turtle 311   Star

```
start
repeat          8
    left        45
    forward     100
    right       90
    forward     200
    right       90
    forward     100
```
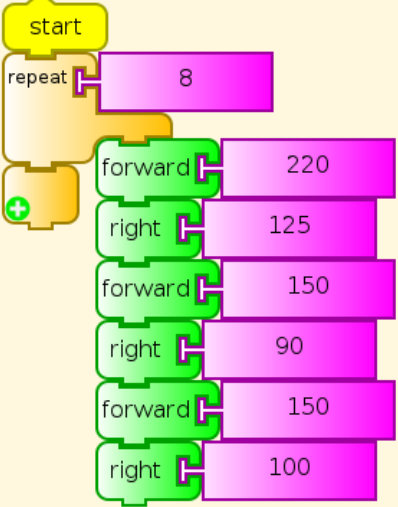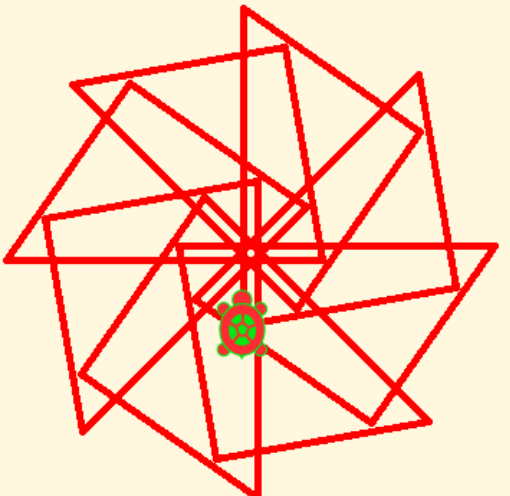
- Make another start that is larger or smaller than this one.
- See what happens when you change some of the angles.
  How many repeats do you need to complete a new star now?

Turtle 312   Windmill

```
start
repeat          8
    forward     220
    right       125
    forward     150
    right       90
    forward     150
    right       100
```
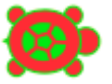
- Change some of the numbers to see what differences occur.
- Try to create a new windmill that does not have blades that touch each other.

TURTLE 313 STAR 2

start
repeat 9
forward 300
right 160

- See what happens if you make the angle higher or lower.
- Try to make other stars that are larger or smaller.
- Can you create a star with a different shape?

TURTLE 314 FENCE

start
repeat 6
forward 100
right 45
forward 50
right 90
forward 50
right 45
forward 100
left 180
pen up
set xy x 0 y 0
pen down
action 1

action 1
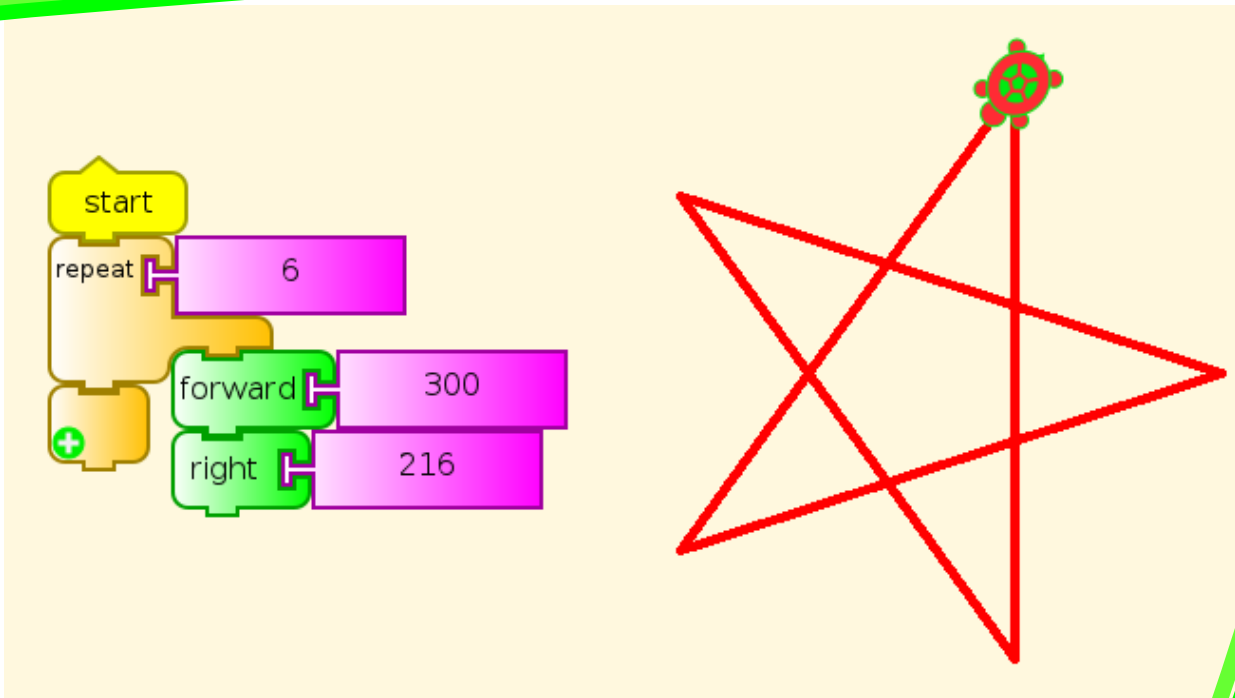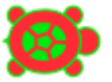repeat 6
forward 100
left 45
forward 50
left 90
forward 50
left 45
forward 100
right 180

- Try to make the fence taller.
- Can you make the fence palings wider or narrower?
- See if you can leave a gap between the two sections of fence for a gate.
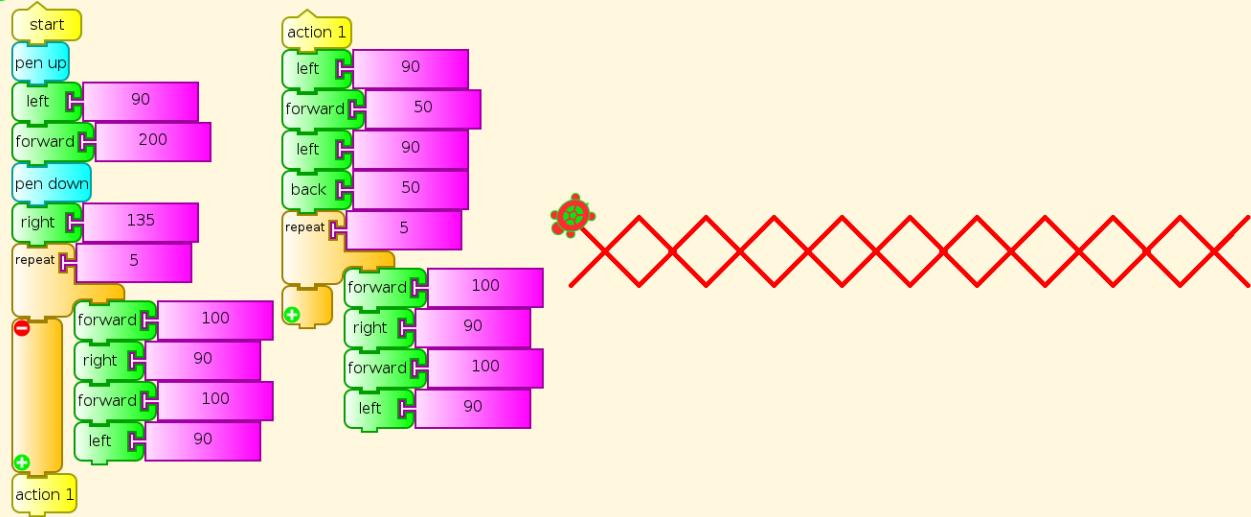- Maybe you could create a gate too!

TURTLE 315   STAR 3

start

repeat [6

forward [300

right [216

- Make the star smaller.
- What other type of star can you make?

TURTLE 316   SPRING
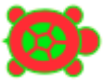
start

pen up

left [90

forward [200

pen down

right [135

repeat [5

forward [100

right [90

forward [100

left [90

action 1

action 1

left [90

forward [50

left [90

back [50

repeat [5

forward [100

right [90

forward [100

left [90

- Make the spring look like it has started to close.
- See if you can stretch the spring out.
- Can you make a spring that goes up and down instead of left to right?

TURTLE 317 STAR 5

start

repeat | 5

forward | 250

right | 145
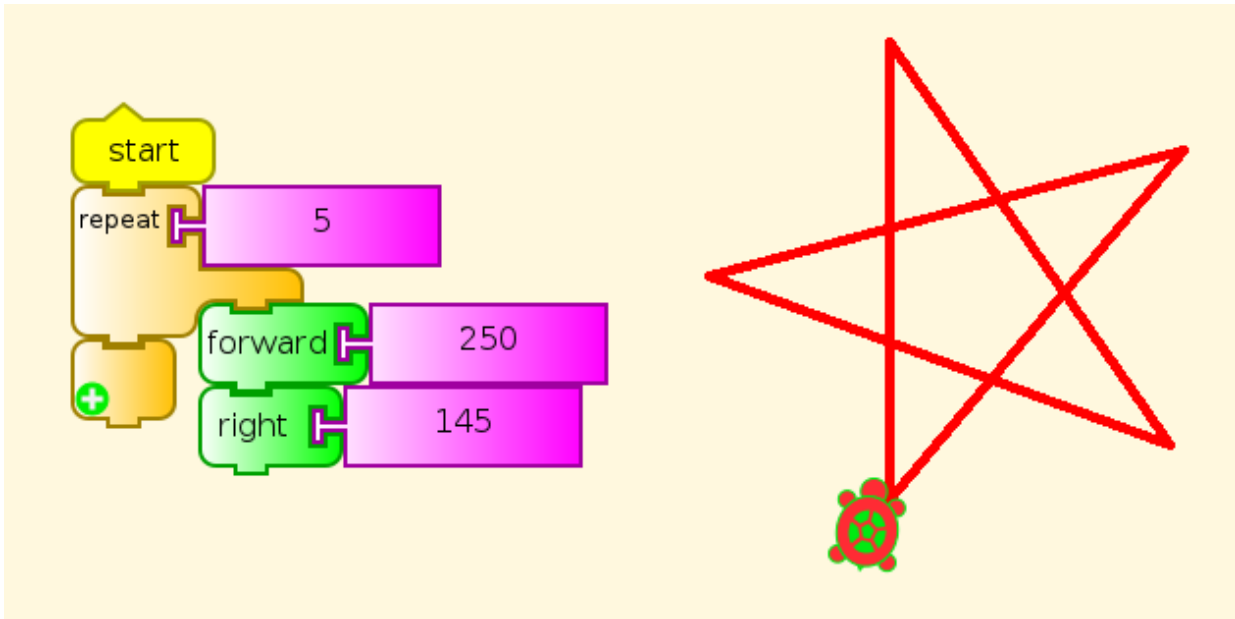
- What happens when you change the angle?
- Can you draw a square around the star?

TURTLE 318 DIAMONDS

start
pen up
left | 90
forward | 500
pen down
right | 135
repeat | 7
forward | 100
right | 90
forward | 100
left | 90
right | 180
repeat | 7
forward | 100
right | 90
forward | 100
left | 90
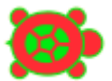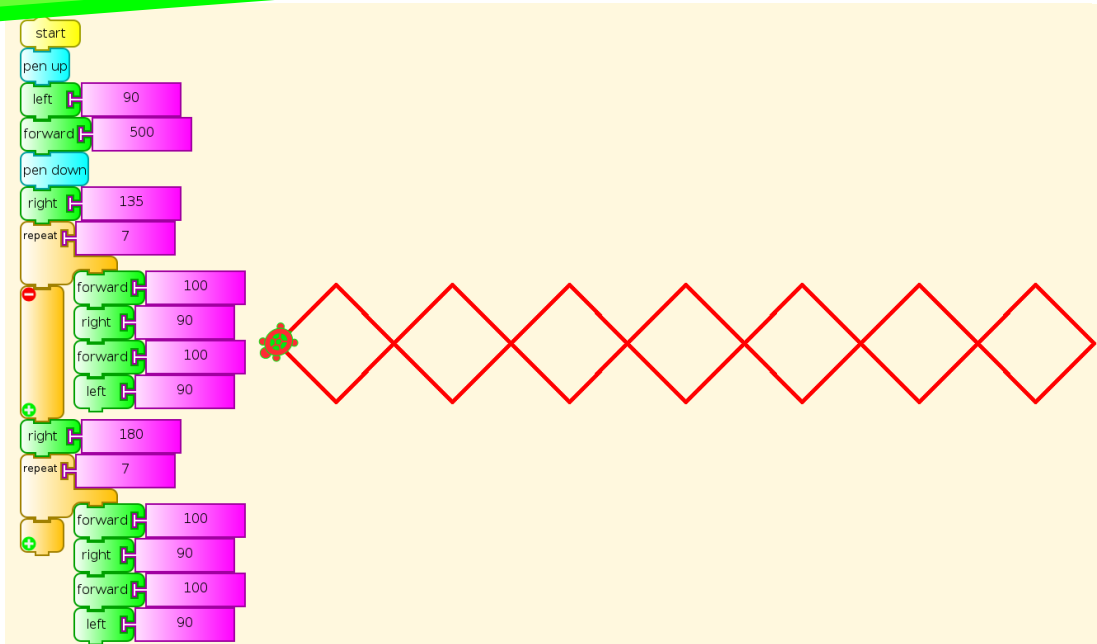
- Try to make another row of diamonds above this row so that it creates a tessellating pattern.
- See if you can make the diamonds taller.
- Can you create a gap between each diamond?

Turtle 319 Hexagon

start

repeat 6

forward 150

right 60

- See if you can make a smaller hexagon inside this one. Can you do it without creating a line that joins the hexagons?
- Can you make the hexagon with a flat base?

TURTLE BLOCKS   TURTLE ART   LOGO

Turtle 320 Star 4

start

repeat 8

right 90

forward 200

right 90

forward 200

right 45

forward 100

back 100

start

repeat 8

right 90
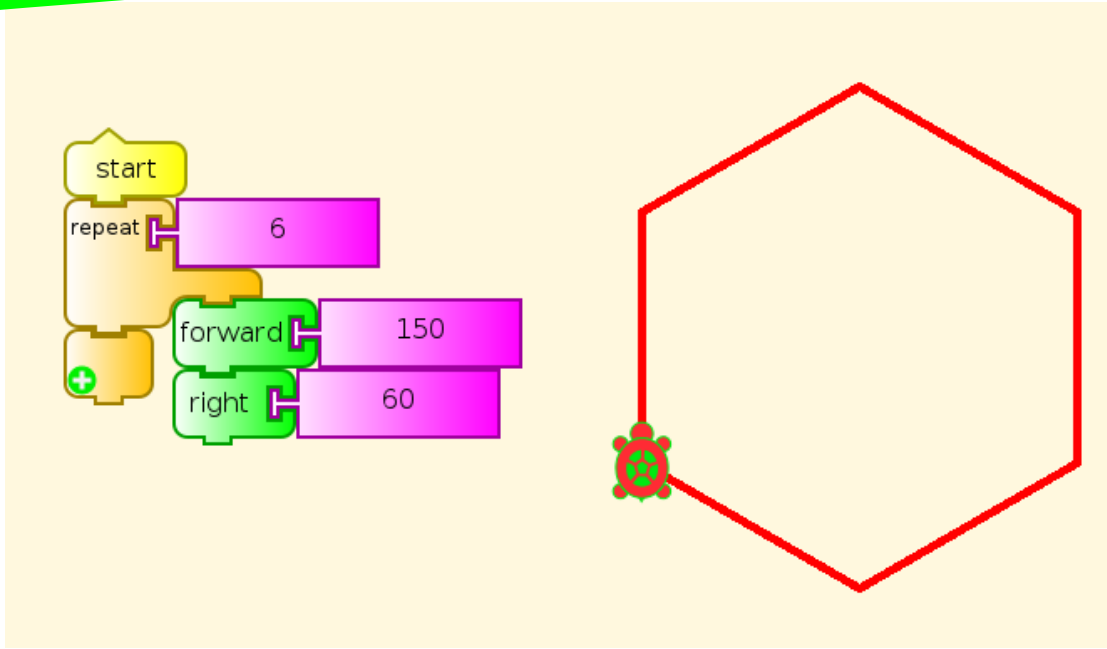
forward 200

right 90

forward 200

right 45

forward 100

back 100

forward 200

right 90

forward 100

right 90

forward 100
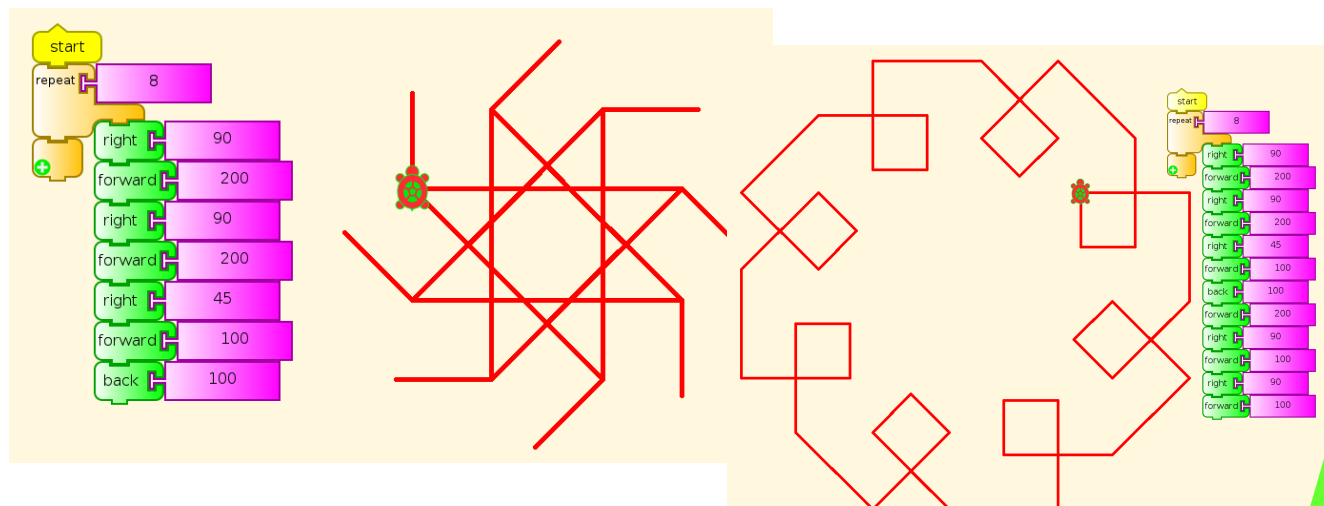
- See what else you can add to the end of each point of a star.
- Make some changes to create the figure on the right side.
- What else can you create by changing some of the numbers?

TURTLE BLOCKS   TURTLE ART   LOGO

TURTLE 321   BIG PLUS

start

repeat | 4

left | 90
forward | 100
right | 90
forward | 200
right | 90
forward | 100

- Can you turn this plus into a cross?
- Try to make the four sides longer without making the centre any larger between the four inside points.
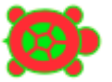
TURTLE 322   ZIG ZAG 2

start
pen up
left | 90
forward | 500
pen down
right | 135
repeat | 6

forward | 100
right | 90
forward | 100
left | 90

action 1

action 1
left | 90
forward | 50
left | 90
back | 50
repeat | 6

forward | 100
right | 90
forward | 100
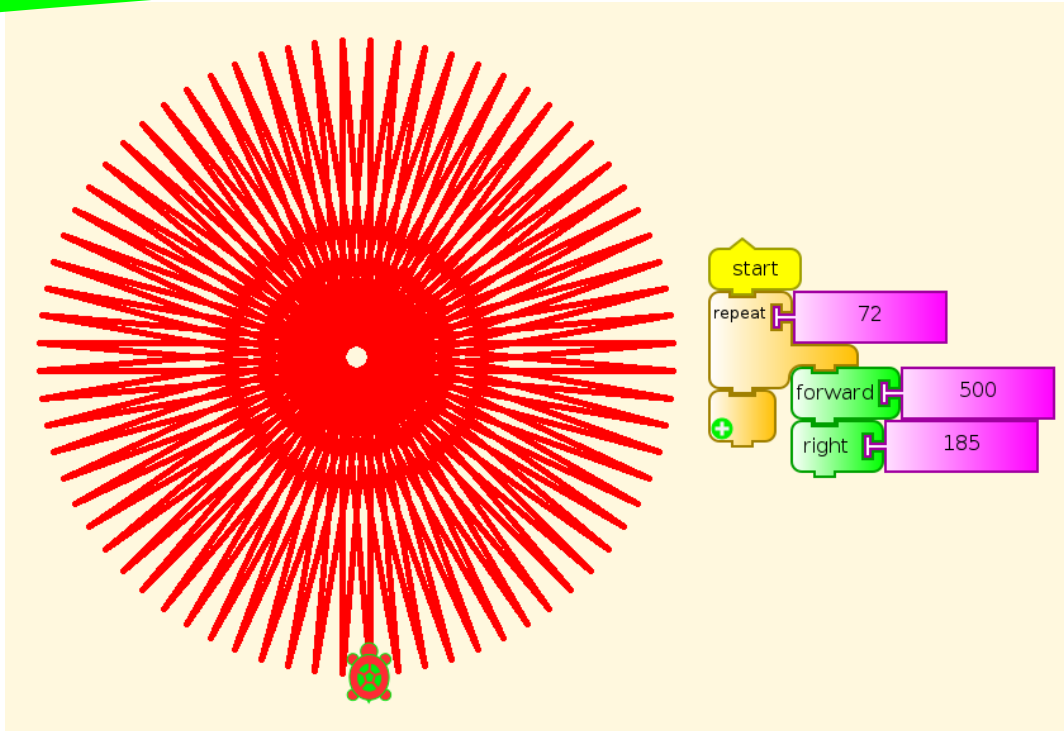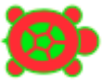left | 90

- See if you can create some handles on the end of your zig zag.
- Maybe you can create something on the other end to make it look like the zig zag has picked up something.
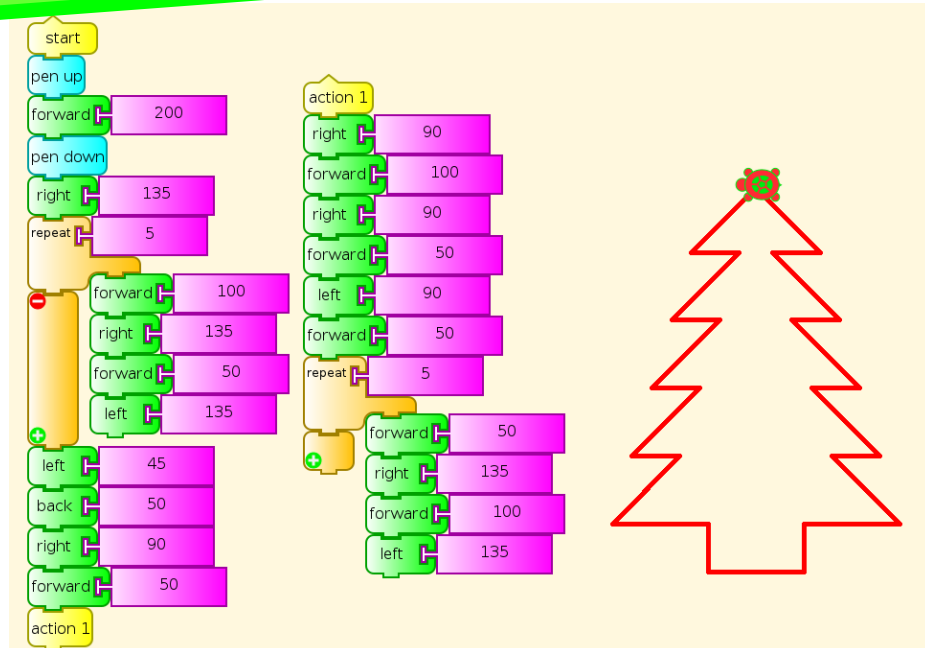
Turtle 323   Sun

```
start
repeat    72
    forward    500
    right    185
```

- Can you change the colour (color) of the sun?
- What happens if you halve the number of repeats?
  Then halve it again?

Turtle 324   Christmas Tree

```
start
pen up
forward    200
pen down
right    135
repeat    5
    forward    100
    right    135
    forward    50
    left    135
left    45
back    50
right    90
forward    50
action 1
```

```
action 1
right    90
forward    100
right    90
forward    50
left    90
forward    50
repeat    5
    forward    50
    right    135
    forward    100
    left    135
```

- This tree would look good if you could put a nice star on top of it.
- Draw the tree in a large pot or box.
- Can you make the tree larger?
- Can you create some things on your tree?

TURTLE 325 TWO OCTAGONS

start
repeat 8
    right 45
    forward 80
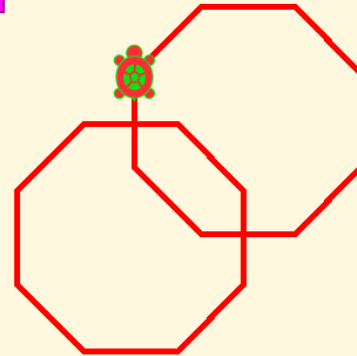pen up
forward 100
right 90
forward 100
left 90
pen down
repeat 8
    right 45
    forward 80

- Can you make four octagons?
- Can you make the two pentagons so they do not touch (intersect) each other?

TURTLE 326 BLOCK PATTERN
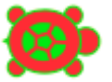
start
repeat 8
    right 45
    forward 50
    right 90
    forward 50
    right 45
    forward 100
    back 100
    left 135
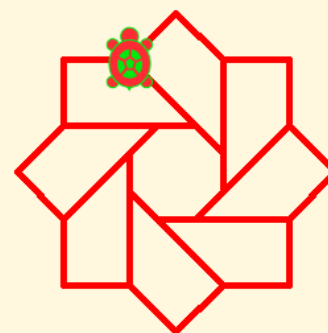
- See what other types of block patterns you can create.
- Can you make the same pattern larger?
  Can you make it just half (50%) bigger than it is now?

TURTLE 327   ANGLE PATTERN

start

repeat 8

- **forward** 150
- **right** 90
- **forward** 150
- **right** 135
- **forward** 100
- **right** 180

- See if you can make this pattern with different angles.
- How many repeats do you need to have if you change the first angle (right angle) to 45 degrees?

TURTLE 328   SQUARE PATTERN

start

repeat 10

- **right** 36
- **forward** 100
- **right** 90
- **forward** 100
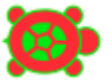- **right** 90
- **forward** 100
- **right** 90
- **forward** 100
- **right** 90

- What other patterns can you create just using squares?
- How many repeats do you need to have if you change the first angle to 18?

TURTLE 329   HEXAGON

start
repeat 6
right 60
forward 150

repeat 10
forward 250
right 108
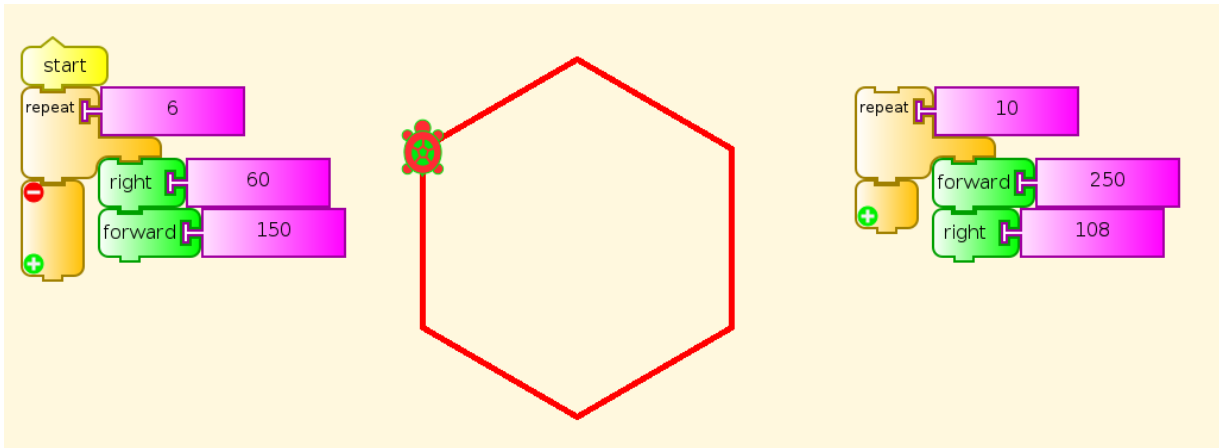
- Look how different you can make this hexagon look by changing all the numbers.
- What else can you create?

TURTLE 330   COOKTOP

start
repeat 4
repeat 18
forward 20
right 20
repeat 10
left 90
pen up
right 90
forward 50
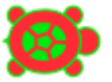pen down
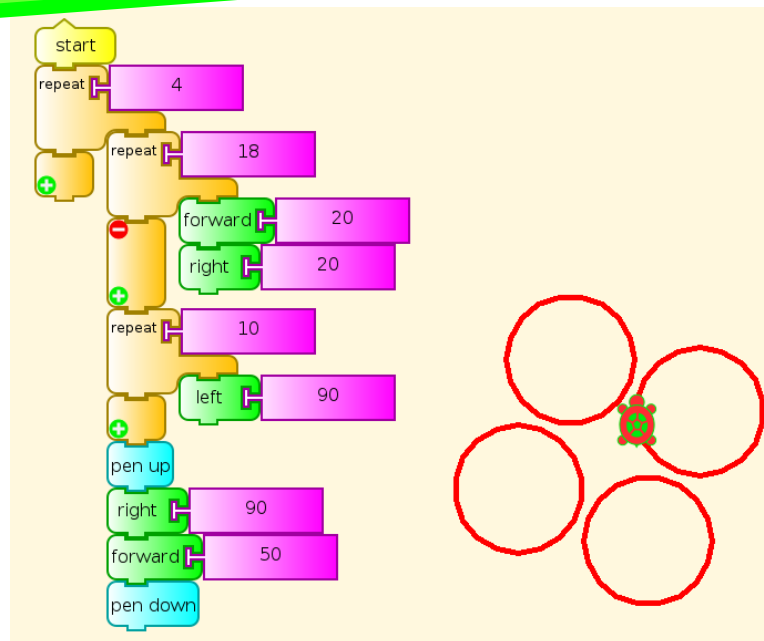
Note: This is not the best way to draw a circle. It is simply one way.

- What else can you draw on this cooktop (stove)?
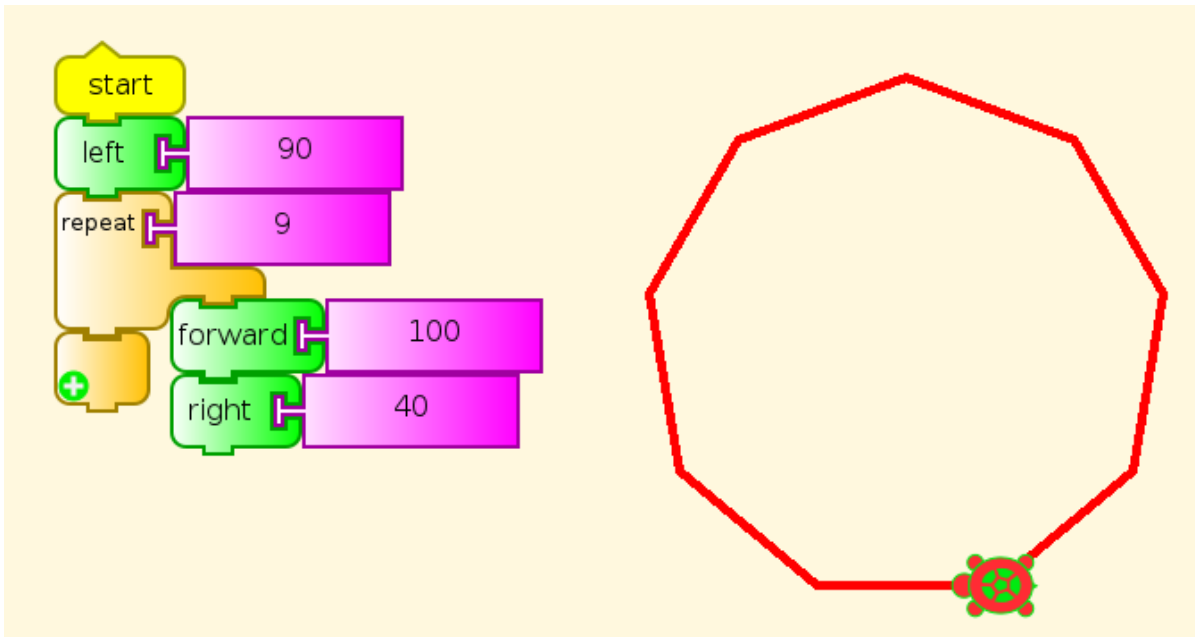- Can you make the circles more perfect (rounded)?

TURTLE 331   9 SIDED SHAPE

```
start
left        90
repeat      9
    forward     100
    right       40
```

A 9 sided shape is called a nonagon.
- Change this nonagon into an octagon.
- Now see if you can create a decagon.

TURTLE 332   RECTANGLE PATTERN
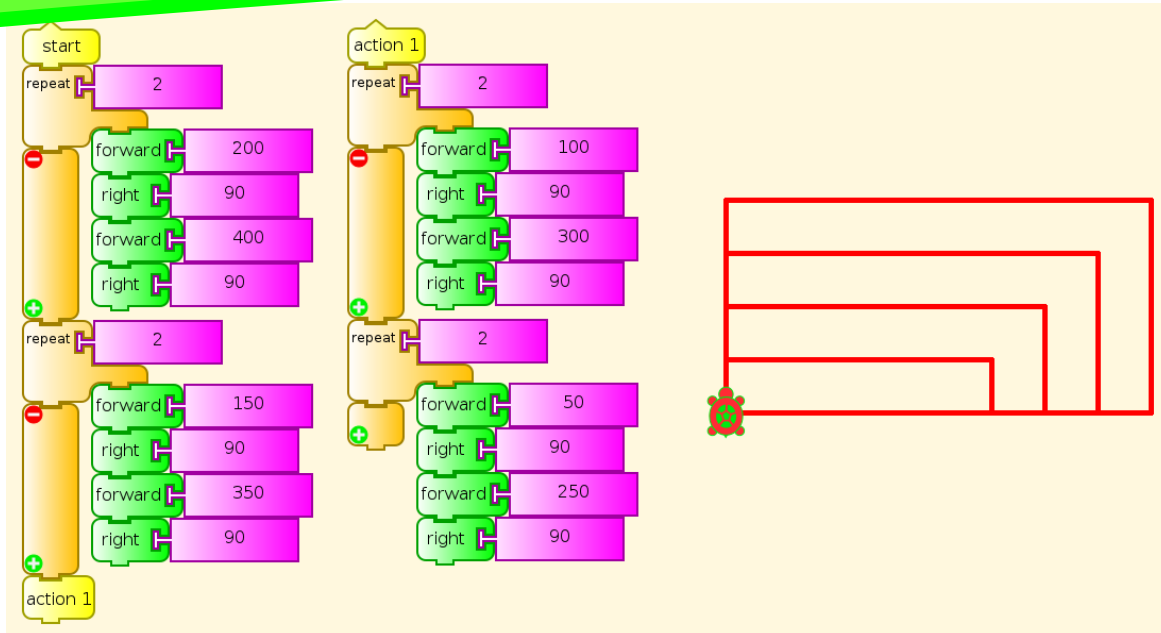
```
start                          action 1
repeat      2                  repeat      2
    forward     200                forward     100
    right       90                 right       90
    forward     400                forward     300
    right       90                 right       90
repeat      2                  repeat      2
    forward     150                forward     50
    right       90                 right       90
    forward     350                forward     250
    right       90                 right       90
action 1
```

- Can you create this pattern with rectangles that are shorter than these ones?
- Can you add two larger rectangles to the pattern?
  Have you kept the increase in size consistent with the originals?