



Lab 9

- choosing a loop pattern
 - use a repeat-as-long-as loop when the goal is however many repetitions fit
 - use a counting loop when there is a known number of repetitions

```
for ( int count = 0,
      declare and initialize loop variables ;
      count < number of repetitions ;
      count = count+1, update loop variables ) {
    loop body
}
// if the loop variables
// are all ints

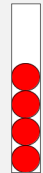
{
  declare and initialize loop variables
  for ( int count = 0 ;
        count < number of repetitions ;
        count = count+1, update loop variables ) {
    loop body
  }
}
// if the loop variables
// are not all ints
```

- 4 geese per group, 4 groups of geese 
- 6 squares per diagonal in Jacob's Ladder 

Lab 9

- identifying loop variables
 - what changes should become loop variable(s)
 - make the variables for directly what you need
 - generally means that there's at least one usage in the loop body not involving an expression or formula

```
// what is repeated? -> draw a red circle
// what changes from one repetition to the next? -> y coordinate
// how do things start? -> circle touching the bottom of the window
// how do things change? -> decrease y by the diameter of the circles
```



if drawing in CENTER mode, make the y loop variable be the y coordinate of the center of the ellipse

- with a counting loop, have additional loop variables for the things that change

```
for ( int count = 0, y = height-20; count < 4; count = count+1, y = y-40 ) {
  fill(255, 0, 0);
  stroke(0);
  ellipse(20, y, 40, 40);
}

for ( int count = 0; count < 4; count = count+1 ) {
  fill(255, 0, 0);
  stroke(0);
  ellipse(20, height-20-count*40, 40, 40);
}
```

Lab 9

Choosing the right pattern should make construction of the loop more straightforward.

- so you don't have to calculate the number of repetitions if what you know is how long to keep going
- so you don't have to calculate where the changing value ends up if what you know is how many times to repeat

Lab 9

Choosing the right loop variables should make the usage of those variables more straightforward.

- so you don't have to figure out potentially complicated formulas or expressions

```
for ( int count = 0, y = height-20; count < 4; count = count+1, y = y-40 ) {
  fill(255, 0, 0);
  stroke(0);
  ellipse(20, y, 40, 40);
}
// y loop variable is the y coordinate of the center
// of the ellipse (drawing in CENTER mode)
```

```
for ( int count = 0, y = height-40; count < 4; count = count+1, y = y-40 ) {
  fill(255, 0, 0);
  stroke(0);
  ellipse(20, y+20, 40, 40);
}
// y loop variable is the y coordinate of the upper left
// corner of the ellipse (drawing in CENTER mode)
```

```
for ( int count = 0; count < 4; count = count+1 ) {
  fill(255, 0, 0);
  stroke(0);
  ellipse(20, height-20-count*40, 40, 40);
}
// no y loop variable
```

