

Name: \_\_\_\_\_

## Working with Variables Part 3

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Last session we spent some time working with variables we created in Processing. Remember that the term variable means able to change. So we were able to have the computer draw a shape over and over again with one aspect of the shape changing each time. The first aspect we chose to change was the position of x (how far to the left or right the shape was on the screen).

```
float px;
```

```
void setup () {  
  size (1400,400);  
  px = 0;  
}
```



What is the width of our canvas? \_\_\_\_\_

What is the height of our canvas? \_\_\_\_\_

```
void draw () {  
  ellipse (px, 200, 70, 35);  
  px = px + 1 ;  
}
```

What did you see when you ran the program?

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What if we were to add the line 'background (20);' to our code? Type the line in just under the 'void draw () {' So the code will now look like this...

```
float px;
```

```
void setup () {  
  size (1400,400);  
  px = 0;  
}
```

```
void draw () {  
  background (20);  
  ellipse (px, 200, 70, 35);  
  px = px + 1 ;  
}
```

How did the picture you created change?

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We can also add other ellipses to our picture. It is just important that we remember to put everything we want drawn between the {} that come after the 'void draw' command. Add four more ellipses like you see here. Notice that we have already done the first one, so we won't need to repeat it.

```
float px;
```

```
void setup () {  
  size (1400,400);  
  px = 0;  
}
```

```
void draw () {  
  background (20);  
  ellipse (px, 200, 70, 35);  
  ellipse (px, 190, 40, 20);
```

```
  ellipse (px, 210, 10, 10);  
  ellipse (px - 20, 205, 10, 10);  
  ellipse (px + 20, 205, 10, 10);
```

```
  px = px + 1 ;
```

```
}
```

Is our figure starting to resemble a familiar object?

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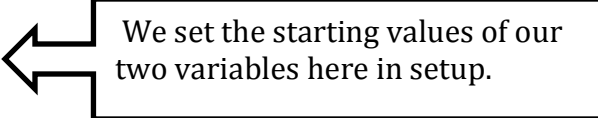
Let's add some color to our ellipses. Make some changes to the *draw* section.

```
void draw () {  
  background (20);  
  fill (150);  
  ellipse (px, 200, 70, 35);  
  fill (250);  
  ellipse (px, 190, 40, 20);  
  
  fill (254, 255, 0);  
  ellipse (px, 210, 10, 10);  
  ellipse (px - 20, 205, 10, 10);  
  ellipse (px + 20, 205, 10, 10);  
  px = px + 1 ;  
}
```

Now, let's put in another variable so that we can also change the height of the spaceship. Just under *float px;* type in the line *float py;*  
The trick is that we are going to have to change each 'y' for our ellipses. The first ellipse can just be changed to *py*. The second ellipse will become *py - 10*. For the third ellipse (the first window in the center of our spaceship) change it to *py + 10*. The final two ellipses change to *py + 5*. Our final code will look like this...

```
float px;  
float py;
```

```
void setup () {  
  size (1400,400);  
  px = 0;  
  py = 300;  
}
```



We set the starting values of our two variables here in setup.

```
void draw () {  
  background (20);  
  fill (150);  
  ellipse (px, py, 70, 35);  
  fill (250);  
  ellipse (px, py - 10, 40, 20);  
  
  fill (254, 255, 0);  
  ellipse (px, py + 10, 10, 10);  
  ellipse (px - 20, py + 5, 10, 10);  
  ellipse (px + 20, py + 5, 10, 10);  
  
  px = px + 5;  
  py = py - 1;  
}
```

What if you took away the *background (20);* line and replaced it with a line that says *stroke (3, 250, 10);*?

You could then make variables for the 3 values that create the color of the stroke.

Can you figure out how to create a shadow that runs underneath the spaceship?

What change can you make so that the ship moves around with the mouse?