One **Picture** (object) from the book classes is (a bit simply) made up of

**one 2-dimensional array of Pixels**

What's an array?

Gaddis: “An array can hold multiple values of the same data type simultaneously.”

One variable holds just one value at a time.

An array is many different variables typically used together for a common purpose.
One **Picture** (object) from the book classes is (a bit simply) made up of

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Plan

typically used together for a common purpose.

As you are working (and puzzling) about the current lab and project 04 with Pictures, study (a little at a time)

all of Ch11 (Gaddis 7) skipping **ArrayList** stuff
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What's an array?
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Pixel (type) for a Picture

double (type) for

double grades[ ]=new double[ 3 ];
grades[0]=55.1;
grades[1]=80.3;
grades[2]=94.2;
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What's an array?
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Pixel (type) for a Picture

int (type) for

int trafTickets[ ] = new int[ 7 ];

trafTickets[0]=72;

trafTickets[1]=45;

... 

trafTickets[6]=54;
One **Picture** (object) from the book classes is (a bit simply) made up of

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SO: an array is many different variables.

Each separate variable is located by the array's name AND some (int) number.
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That's 2 numbers for 2-dim arrays.

```java
this.getPixel( x, y ).setColor( purple );
```

(the int values of `x`, `y` LOCATE which Pixel to change.)

```java
int today;
    today = calendar.get(Calendar.DAY_OF_WEEK);
    trafTickets[today]=trafTickets[today]+1;
```
Any particular computer...

Has a fixed, finite amount of memory. Pretty big today. (But you can buy and add more memory usually when the computer is off.)

Computer memory is like a big array. memory addresses (integers) LOCATE WHERE data is stored.
What's an array?
Gaddis: “Once an array is created, its size cannot be changed.”
Just like a book classes' Picture.
Suppose `this.getWidth()` returns 640. ONLY numbers 0 to 639 can locate Pixels in the x direction.

.... `this.getPixel( 650, y )`; makes your Java program run CRASH with an **out of bounds** runtime error!
similarly if your computer did
... `trafTickets[ 7 ]`...;