# Arrays and Functions

# Arrays & Memory

- This model isn’t quite accurate…

| test[0] | test[1] | test[2] | test[3] | test[4] | test[5] |
|---|---|---|---|---|---|
| 1 | 45 | 7 | 1000 | -105 | 42 |
| 0x42 | 0x43 | 0x44 | 0x45 | 0x46 | 0x47 |

# Arrays & Memory

- This model isn’t quite accurate…
  - The memory of an integer is larger than one bit
  - Therefore, there has to be more space between the elements of this array

| test[0] | test[1] | test[2] | test[3] | test[4] | test[5] |
|---|---|---|---|---|---|
| 1 | 45 | 7 | 1000 | -105 | 42 |
| 0x42 | 0x43 | 0x44 | 0x45 | 0x46 | 0x47 |

# Arrays & Memory

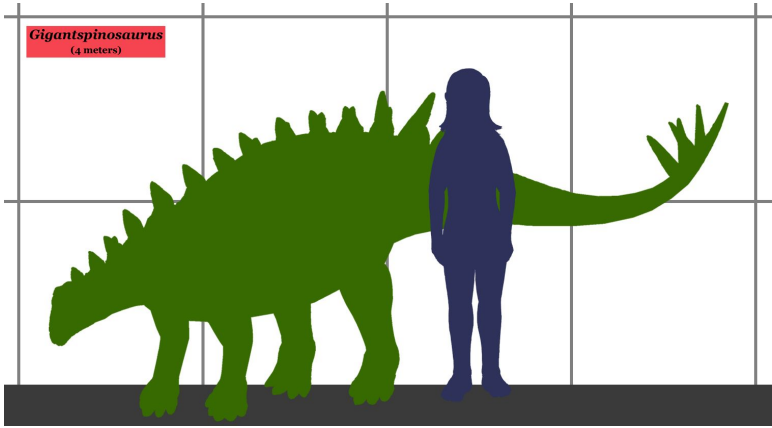
- How much space? It depends on integer memory…
  - Use the sizeof() function to determine this

| test[0] | test[1] | test[2] | test[3] | test[4] | test[5] |
|---|---|---|---|---|---|
| 1 | 45 | 7 | 1000 | -105 | 42 |
| 0x42 | 0x43 | 0x44 | 0x45 | 0x46 | 0x47 |

# Sizeof()

- Included in <stdio.h>
- Determines the size of variables, in bytes

*See array_sizeof.c in github to see it in action



# Arrays and Functions

- Arrays can be passed into functions…
  - As long as the function knows 1) the start location, and 2) the size of each element within the array

  - Start location = name of the array
  - Size = given by sizeof(), OR the type of the array

# Arrays and Functions

- Then the function can directly modify the elements
  - Similar to pointers, but without the * / &

# Arrays and Functions

- Passing arrays into functions requires specific syntax

- Function Declaration

*> type name(**int test[]**, int max_size);*

*/* The array has to include empty square brackets [] to show that it is an array */*

# Arrays and Functions

- Passing arrays into functions requires specific syntax

- Function Declaration / Definition

*> type name(int test[]**, int max_size**);*

*/* It is usually extremely helpful to include the maximum size of the array as well */*

# Arrays and Functions

- Passing arrays into functions requires specific syntax

- Function Invocation

*> name(test, size);*

*/*ONLY need to give the name of the array*/*

# Array Coding: Part 1

- Write a program that fills an array with 5 numbers scanned in from the user
- Print the contents of the array

- Requirements: The printf() statement has to be within a function (not main() )

# Array Coding: Part 2

- Write a program that fills an array with 5 numbers scanned in from the user, then checks to see if those numbers are prime. If they are NOT prime, they should be replaced with the number 1 within the array.
- Requirements: The check/replacement should be within a function. The printf() statement has to be in a different function