Module III: Processes

Learning Goals

- recognize the use of and predict the behaviour of instructions, variables and flow of control constructs in short programs specified in Scratch or Javascript, or in other clearly expressed processes (which may or may not be computer related)
- make small modifications to short program fragments to achieve clearly specified tasks
- apply the "model/predict/experiment/refine" technique to learn new programming constructs and debug short programs

Processes and Programs

- **process or algorithm**: a specification of instructions for accomplishing (i.e., executing) a task

- **program**: a process that is specified in a language that can be interpreted by a computer

Interfaces | Processes | Data

- dist 110
- step move 2
- South: my-y-position
- North: my-y-position
- East: my-y-position
- West: my-y-position
- Green Flag
- Stop Sign
Examples of Processes

• assembly manual
• recipe
• shuffling a deck of cards
• programs underlying Google search, Word (or any computer application)
• the inner workings of a bank machine

in each case, what is the task?

One Process

Jello Instant Pudding

1. put 3 cups of milk in a bowl
2. add entire contents of package
3. whisk for 2 minutes
4. transfer to serving bowls
5. let stand for 3-5 minutes
6. serve!

Example: Currency Conversion

task specification:
• input: amount in Canadian dollars
• output: amount in US Dollars

process or algorithm (informal):
• multiply the amount in Canadian dollars by the current exchange rate and output the result

Example: Currency Conversion

Scratch process:

• interface sprite asks user for input and provides output

• process sprite does calculation
Example: Currency Conversion

Scratch process:

- **process** sprite does calculation

- **javascript** code to do the same calculation

```
function convert(CAD) {
  var ExchangeRate;
  ExchangeRate = 1.5;
  return ExchangeRate * CAD;
}
```

- **Activity**: create models that will help you predict the behaviour of instructions, variables and flow of control in Scratch scripts and Javascript programs

- Note: parameter CAD and variable ExchangeRate persist only when the function is executed

Example: Currency Conversion

Experimenting with Javascript

- **Activity**: create models that will help you predict the behaviour of instructions, variables and flow of control in Scratch scripts and Javascript programs

- inside an otherwise empty body of an html file, put your function within script tags

- use alert commands to test your function

- for an example, see course webpage

- now, try different alert calls to test what your function is doing

- you can also add alert calls within the function itself