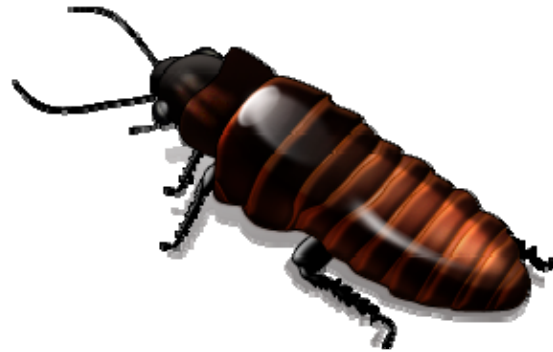


# Know Your Bugs:

## Logic Errors



### Explanation

Your program runs, but are you done yet? NO!

Programs can compile and run without generating an error, but it still might not do what is expected.

Symptoms:

- Unexpected output
- Programs that don't finish

What should you do?

TEST, TEST, TEST!

# Ontario Curriculum Expectations

## **ICS2O (Grade 10):**

- B2.6. explain the difference between syntax, logic, and run-time errors.
- B3.3 use a tracing technique to understand program flow and to identify and correct logic and run-time errors in a computer program.
- B3.4. demonstrate the ability to validate a computer program using test cases.

## **ICS3U (Grade 11 university prep):**

- A4.1. demonstrate the ability to identify and correct syntax, logic, and run-time errors in computer programs.
- A4.5. demonstrate the ability to validate a program using a full range of test cases.

## **ICS3C (Grade 11 college prep):**

- A3.1. explain the difference between syntax, logic, and run-time errors in computer programs.
- A3.5. demonstrate the ability to validate a program using test cases.

## **ICS4U (Grade 12 university prep):**

- A4.2 develop and implement a formal testing plan for a software project to ensure program correctness.

## **ICS4C (Grade 12 college prep):**

- A4.3. develop and implement a formal testing plan for a software development project to ensure program correctness.

# Sample Follow-up Exercises

## **Example of Program with Logic Errors in Turing**

```
var number, double : real

put "Enter a number: "..
get number
double := number/2
put number, " X 2 = ", double
```

## Example of Program with Logic Errors in Visual Basic

```
Dim ABC As Boolean
Dim A As Integer
Dim B As Integer
A = 3
B = 2
ABC = (A + 1 = B)
Print ABC
```

Using an error log such as the one below, students should debug the code provided.

### Sample Error Log

Type of Error	Description/Example	Correction
logic	Divide should be multiply  double := number/2	double := number*2
logic	Wrong number initialized into variable A  A = 3	A = 1

### Another Possible Activities

1. Have students will submit code with logic errors electronically to each other or the teacher, and then each student is assigned a random program to debug and get running.
2. Start your own collection of programs with logic errors. This collection can be use for quizzes, tests, and classroom practice.
3. See the Summer Institute 2008 resource by Jaqueline Payne on debugging and verification. This resource contains a number of Turing files complete with logic, runtime, and syntax errors. (<http://www.cemc.uwaterloo.ca/events/csteachers.html>)