



Perimeter

Computer Science Concepts

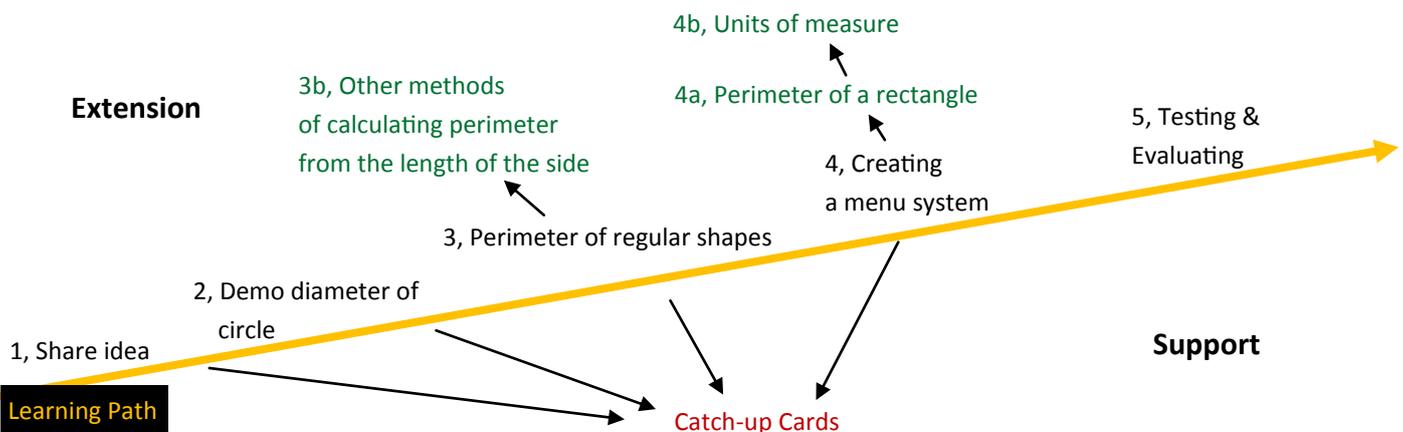
- Converting user input into a variable
- Multiplying a variable*
- Using one variable to set the amount in another variable*
- Using conditional selection blocks to make a menu

Program Aim Can the users create a program that asks the user for the length of the side and then works out the length of the perimeter of regular 2D shapes

Maths Concepts

- Perimeter of regular 2D shapes can be calculated by multiplying length of side by number of sides
- Use an asterisk (*) to denote multiply on a computer

Differentiation and Assessment for Learning This planning should be used alongside the *catch-up cards* supporting SEN pupils and the *extension cards* supporting the more able. At the beginning of each session the *learning intention sheet* is shared and the learning journey expanded through success criteria. Pupils feed their progress back to the teacher through annotating this sheet with smiley faces at the end of the lesson. Teachers can also annotate the sheet to indicate those who need more or less help in future lessons. These extra resources can be found on the code-it.co.uk website.



Computing Program of Study

- design, write and debug programs that accomplish specific goals
- work with variables

1, Share idea

Explain to your class that they are going to make a program that works out the perimeter of regular 2D shapes.

If you are not doing perimeter at this time in maths then a quick revision on the concept will help. You could start with the task on the bottom of the learning intentions sheet.

Resources

- [Diameter of a circle faded hand-out for annotation](#)
- Scratch 1.4 or 2.0
- Helpful polygon resource to print**
<http://www.greatlittleminds.com/pages/maths/polygons/regular-polygons.html>



Junior

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Perimeter P2

2, Demo diameter of circle

Show pupils how you could create a program to calculate the diameter of a circle from the radius. Point out that an asterix is used to multiply and a forward slash for divide. Model how this works with two boxes to represent the variables and pencils to represent the numbers. Make sure you choose low length sides as you may run out of pencils. Get the children holding the variable boxes to say what is in their variable (box) when you get to the say command. Now hand them the [faded version of the diameter of a circle](#) so they can work in pairs to annotate how they might adapt this idea to calculate the perimeter of a square from the length of one side.

```

when clicked
ask "What is the radius of your circle?" and wait
set radius to answer
set diameter to radius * 2
say "A circle which has a radius of radius has a diameter of diameter for 2 secs

```

3, Perimeter of regular shapes

Pupils then move on to create a block of code for a square using Scratch. Once they have finished encourage them to create **separate** blocks of code for a pentagon, hexagon etc.

A square example

```

ask "What is the length of your square?" and wait
set length to answer
set perimeter to length * 4
say "Perimeter of a square whose length is length is perimeter

```

3a Other methods of calculating the perimeter of a 2d shape from the length of its side

An interesting extension for pupils who have created lots of 2d regular shapes is to ask them if there is another way of calculating the perimeter from the length of the sides.

```

when clicked
ask "What is the length of one side?" and wait
set length to answer
set perimeter to length + length + length + length
say "A square of length length has a perimeter of perimeter for 5 secs

```

One alternative method of calculating the perimeter of a square from the length



Perimeter P3

4, Creating a menu system

If you have previously created the greater than, less than or equal to menu in the coin sorter then just refer pupils to this and challenge them to create a menu. Some pupils however will need more support than this.

Create this simple menu system

Then demonstrate how we can fill it with our blocks created earlier.

```
when clicked
ask Type 1=triangle 2=square 3=pentagon and wait
if answer = 1
if answer = 2
if answer = 3
```

```
when clicked
ask Type 1=triangle 2=square 3=pentagon and wait
if answer = 1
ask What is the length of one side of your equilateral triangle? and wait
set length to answer
set perimeter to length * 3
say join join join Perimeter of an equilateral triangle whose length is length is perimeter
if answer = 2
ask What is the length of your square? and wait
set length to answer
set perimeter to length * 4
say join join join Perimeter of a square whose length is length is perimeter
if answer = 3
ask What is the length of your regular pentagon? and wait
set length to answer
set perimeter to length * 5
say join join join Perimeter of a regular pentagon whose length is length is perimeter
```



Perimeter P4

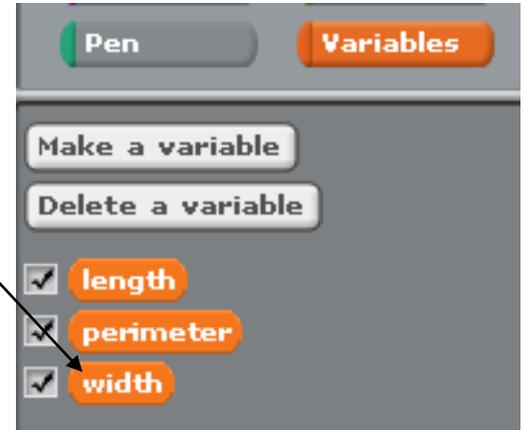
4a, Perimeter of a rectangle

This is a harder challenge so I have included the code here

In my solution **which is not the only one** pupils first create a new variable called width

They then go on to multiply width and length by 2 and add them together to find the perimeter

Don't show a solution to this until they have had time to attempt this. In some Y6 classes over 50% managed this independently.



```
ask [What is the length of your rectangle?] and wait
set [length] to [answer]
ask [What is the width of your rectangle?] and wait
set [width] to [answer]
set [perimeter] to [length * 2 + width * 2]
say [join Perimeter of a rectangle where width is [width] join and join length is [length] join is [perimeter]]
```



4b, Units of measure

If we type in cm, mm or m at the end of the number the computer won't understand that we are dealing with numbers so we have to deal with units separately. Can pupils create code that allows the user to use units

5, Testing and evaluating

Get pupils to put their code in presentation mode and place their learning intentions sheets in front of the computer. Pupils then go round and leave notes about any bugs they find.