Algorithms	Season	1
	Episode	01
	Time frame	1 period

Objectives :
- Read an algorithm.
- Follow an algorithm with paper and pen.

Materials :
- *Slideshow explaining the main concepts.*
- *Task sheet.*
- *Answer sheet.*

1 – Short lecture about algorithm   10 mins

Using a slideshow, the teacher explains the main concepts about algorithms and gives an example.

2 – Group work   45 mins

The class is divided in four groups. Each group has to carry out a few tasks involving algorithms. Each task is awarded a certain mark to make up a final mark at the end of the lesson.

Algorithm # 1

Begin
  Input : A
  $A + 2 \rightarrow A$;
  Output : A
end

1. Apply this algorithm to the following inputs.

Input	0	5	-2	10
Output				

2. What seems to be the purpose of this algorithm ?

Algorithm # 2

Begin
  Input : x;
  If $x > 0$ **then**
  $\mid$ **Output** : x
  else
  $\mid$ **Output** : $-x$
  end_if
end

1. Apply this algorithm to the following inputs.

Input	2	-2	5	-5	-8	-9
Output						

2. What seems to be the purpose of this algorithm ?

Algorithm # 3

Begin
  Input : (x, y)
  $10x + y \rightarrow u$;
  $100u \rightarrow v$;
  $100v \rightarrow w$;
  $u + v + w \rightarrow s$;
  Output : s
end

Apply this algorithm to the following inputs.

Input	$(5, 3)$	$(2, 1)$	$(6, 7)$
Output			

Algorithm # 4

```
Begin
   Input : (A, B)
   A + B → A ;
   A − B → B ;
   A − B → A ;
   Output : (A, B)
end
```

1. Apply this algorithm to the following inputs.

Input	$(2,3)$	$(5451, 721)$	$(\sqrt{5}, \pi)$
Output			

2. What seems to be the purpose of this algorithm ?

Algorithm # 5

```
Begin
   Input : u
   1 → Step ;
   Output : "Step 1 : ", u
   Repeat 9 times
        Step +1 → Step ;
        If u is even
        then
        |  u/2 → u
        else
        |  3 × u + 1 → u
        end_if
        Output : "Step ", Step ," : ", u
   end_repeat
end
```

Apply this algorithm to the following inputs.

Input	1	6
Output 1		
Output 2		
Output 3		
Output 4		
Output 5		
Output 6		
Output 7		
Output 8		
Output 9		
Output 10		

Extras

1. In a shop, during sale time, there is a 10% discount if the amount of the purchase is greater than or equal to 500 pounds. Write an aglorithm that computes actual amount paid by the customer.

```
Begin



end
```

2. Write an algorithm that builds the multiplication table for a number less than 10.

```
Begin



end
```