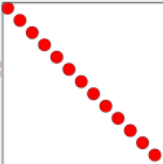


Names: _____

Loop Questions

- Is a loop needed?
 - yes, if there are more than a few copies and you either want to do the same thing repeatedly or what changes between copies changes in a predictable way
- What is repeated?
- What changes from one repetition to the next?
- How do things start?
- How do things change?
- When do you keep going?
 - repeat *n* times (counting loop)
 - repeat as long as / until – condition involves one or more of the “what changes” elements

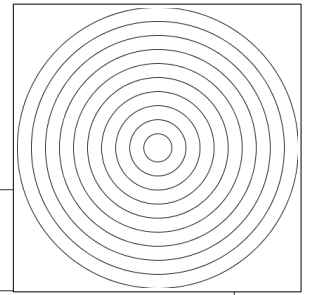
Loop Questions		stack of four circles	
• What is repeated?	draw a red circle		
• What changes from one repetition to the next?	the x and y coordinates of the circle		
• How do things start?	at the top – (CENTER mode) x = radius of circle y = radius of circle		
• How do things change?	x, y increase – add the diameter of the circle		
• When do you keep going? – two patterns • repeat <i>n</i> times (counting loop) • repeat as long as / until – condition involves one or more of the “what changes” elements	as long as the whole circle fits within the window – (CENTER mode) x + radius <= width y + radius <= height		
• What is repeated?	draw a red circle		
• What changes from one repetition to the next?	the y coordinate of the circle		
• How do things start?	at the bottom – (CENTER mode) y = height - radius of circle		
• How do things change?	y decreases – subtract the diameter of the circle		
• When do you keep going? – two patterns • repeat <i>n</i> times (counting loop) • repeat as long as / until – condition involves one or more of the “what changes” elements	repeat 4 times		

At the End of Class

Hand in this worksheet.

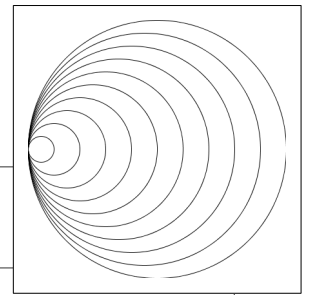
Exercises

1. A sketch which draws the picture shown. The circles should go all the way to the edge (or as close as possible – no circle should extend outside the window) – no matter what size the window is.



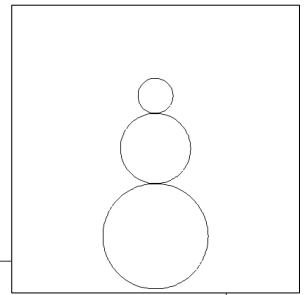
what is repeated?	drawing a circle
what changes from one repetition to the next?	the size (diameter) of the circle
how do things start?	from middle – diameter 30
how do things change?	diameter increases – add 30
when do you keep going?	as long as the circle fits in the window (diameter doesn't exceed width or height of window)

2. A sketch which draws the picture shown. The circles should go all the way to the edge (or as close as possible – no circle should extend outside the window) – no matter what size the window is.



what is repeated?	drawing a circle
what changes from one repetition to the next?	the size (diameter) of the circle the y coordinate of the upper left corner of the circle (CORNER mode)
how do things start?	with the smallest circle – diameter 30, y height/2-15
how do things change?	diameter increases – add 30 y decreases – subtract 15
when do you keep going?	as long as the circle fits in the window (diameter doesn't exceed width or height of window)

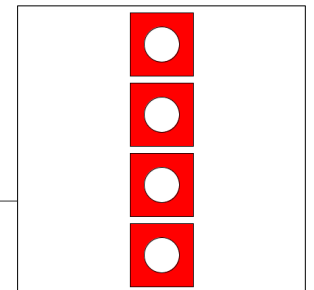
3. A sketch which draws a snowman consisting of three circles as shown. (Use a loop – don't just draw three separate circles!) Each circle is a fixed amount smaller than the circle below it



what is repeated?	drawing a circle
what changes from one repetition to the next?	size (diameter) of the circle y coordinate of the center of the circle (CENTER mode)
how do things start?	with the biggest circle – size 150, y height-75
how do things change?	size decreases – subtract 50 y decreases – subtract half the height of the current circle and half the height of the next smaller circle
when do you keep going?	repeat 3 times

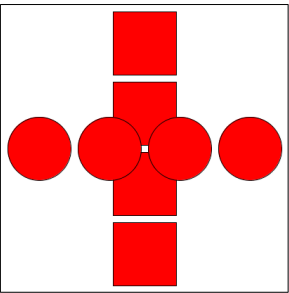
;

4. A sketch which draws the picture shown.



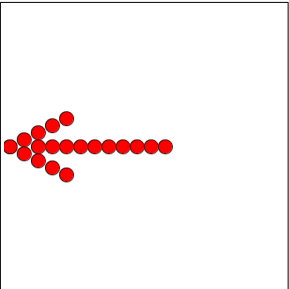
what is repeated?	red square containing a white circle
what changes from one repetition to the next?	y coordinate of the center
how do things start?	from the bottom – y height-50
how do things change?	y decreases – subtract 100
when do you keep going?	as long as the entire pattern fits in the window – $y-50 \geq 0$

5. A sketch which draws the picture shown.



what is repeated?		
what changes from one repetition to the next?		
how do things start?		
how do things change?		
when do you keep going?		

6. A sketch which draws the picture shown. Each part of the arrow should have the number of circles shown.



what is repeated?		
what changes from one repetition to the next?		
how do things start?		
how do things change?		
when do you keep going?		