



Designing Computer Programs in
Elementary School

TJHSST Computer Systems Lab
Crystal Noel
2008-2009





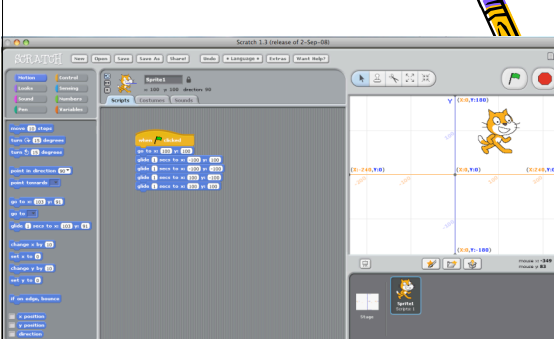

Cardinal Forest Elementary School

- Students
- Teachers
- Parents




Scratch

- MIT Media Lab
- Simplicity in Programming
- Online Community


Research Focus

- Value in Program Design
 - Problem solving skills
 - Troubleshooting
 - Independence
 - creativity



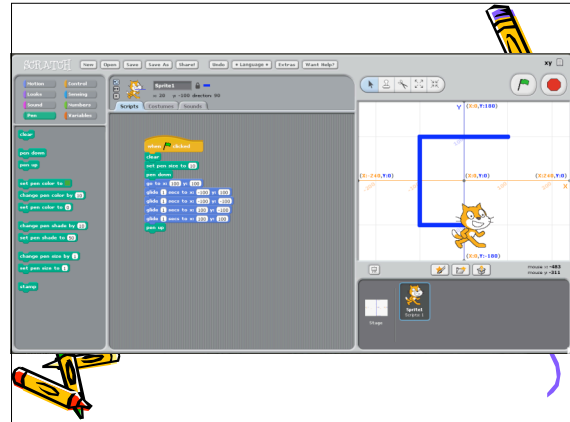
Timeline

- October - November: Basic scratch skills
- December - February: Teacher designed programs
- March-May: Student Projects



Project One

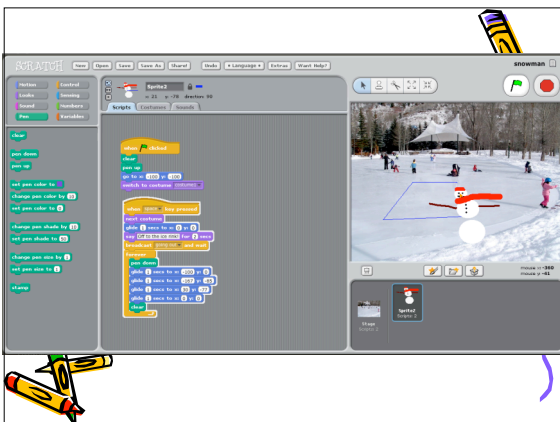
- Re-enforce xy coordinates
- Move Kitty around the xy grid
- Use pen tools to draw a square



Task	Check?
Stage: 	
Does Kitty start at x: 100 y: 100? 	
Does Kitty end at x: 100 y: 100? 	
Does Kitty use 4 steps to move in a square? 	
Bonus: Does Kitty draw the square as he moves? 	
Bonus: Does the square that kitty has drawn disappear when you start the program over again?	

Winter Project

- Less emphasis on xy - more on Scratch skills
- Part 1: move a snowman around the ice rink
- Part 2: snowman starts in an igloo, changes clothes and moves to the ice rink














Part 1: Winter Wonderland Project Rubric

Step	Task	Check?
1	Stage: 	
2	Does your snowman have 2 costumes? 	
3	Does your snowman start at x: 100 y: 100? 	
4	Is the snowman wearing the costume that you drew for him? 	
5	Does your snowman glide around the ice rink? 	
6	Does your snowman stay on the ice rink? 	
7	Bonus: Does your snowman glide around the ice rink forever?	

Fish Game

- Introduction to Game Design
- Random movement
- Variables
- Control with the Keyboard

Fish Game Rubric

Step	Task	Check?
1	Stage: 	
2	Big Fish Sprite: 	
3	When you press the arrow keys, does the Big Fish move that way? 	
4	Red Fish Sprite: 	
5	Does your red fish move randomly? 	
6	Does your red fish hide when the Big Fish eats it? 	
7	Does your red fish show in a different spot after it is eaten? 	
8	Does your Big Fish change costumes when it eats the red fish? 	
9	Does your game keep score? 	
10	Do you have three red fish? 	
11	Does the Big Fish say "Game Over"? 	

Project Design

- Make your own Rubric Activities
- Project Categories:
 - PacMan
 - Super Mario
 - Dodgeball
 - Story

Make Your Own Project!

Task	Check?
1 Sprite	
2 Backgrounds	
Change Sprite	
Costume 1 time	

Circle:

4 Control Scripts

```
1. when green flag clicked, say Hello, 2 sec, hide
2. when green flag clicked, say Hello, 2 sec, show
3. when green flag clicked, say Hello, 2 sec, show
4. when green flag clicked, say Hello, 2 sec, show
```

2 Motion Scripts

```
1. when green flag clicked, go to x:50%, y:50%, rotate 0 degrees
2. when green flag clicked, go to x:50%, y:50%, rotate 0 degrees
3. when green flag clicked, go to x:50%, y:50%, rotate 0 degrees
4. when green flag clicked, go to x:50%, y:50%, rotate 0 degrees
```

1 Looks Script

```
1. when green flag clicked, say Hello, 2 sec, show
2. when green flag clicked, say Hello, 2 sec, show
3. when green flag clicked, say Hello, 2 sec, show
4. when green flag clicked, say Hello, 2 sec, show
```

Draw a rectangle around your new script.

2 Scripts from: Pen, Sensing, Numbers, or Variables

1. _____
2. _____

Difficulties Faced

- Student Behavior
- Range of Learning Curves
- Need for Individual Attention

Sample Student Projects

Observations



Conclusion



What is next?

