Code Write-up and Explanation
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Scene 1: Loading Bar

```
onClipEvent (enterFrame) {
        loading = _parent.getBytesLoaded();
        total = _parent.getBytesTotal();
if (percent == undefined) percent = 0;
        percent -= (percent-((loading/total)*100))*.25;
        per = int(percent);
        percentage = per+"%";
        loadBar._width = per;
        if (percent>99) {
                _parent.gotoAndStop(2);
        }
}
```

Drag-and-Drop Sample Code

```
on (press) {
          startDrag(this, true);
}
on (release) {
          stopDrag();
}
```

Button Sample Code

```
on (release) {
          gotoAndPlay("ShipMenu", 1);  //put the name of the next scene here
          }
```

Character Interaction Sample Code

```
box.text="Hi!  Welcome to S.T.A.R. Station II!  If you need any help, feel free to look at
my notebook.  There are a lot of tips, tricks, facts, and cool websites to help you out.";
//box is the name of the text box.  Set the text in quotes to say whatever you want.
```

Side.as Code

```
class Side{
private var color:String;
public function Side(){
var colorNum = Math.floor(Math.random()*8)+1;
switch(colorNum)
{
case 1: color="0xFFFF00";//yellow
break;
case 2: color="0x1941A5";//blue
break;
case 3: color ="0xFF0000";//red
break;
case 4: color="0xFF6600";//orange
break;
case 5: color="0x990099";//purple
break;
case 6: color="0x009900";//green
break;
case 7: color="0xFFFFFF";//white
break;
case 8: color="0x000000";//black
break;
}
}

function getColor():String{
return color;
}
}
```

Cube.as Code

```
class Cube{
private var side1:Side;
private var side2:Side;
private var side3:Side;
private var side4:Side;
private var side5:Side;
private var side6:Side;


public function Cube(){
side1=new Side();//left tab
side2=new Side();//top tab
side3=new Side();//bottom
side4=new Side();//bottom tab
side5=new Side();//right tab
side6=new Side();//top
}

public function getSide(num):String {
switch(num){
```

```
case 1: return side1.getColor();
break;
case 2: return side2.getColor();
break;
case 3: return side3.getColor();
break;
case 4: return side4.getColor();
break;
case 5: return side5.getColor();
break;
case 6: return side6.getColor();
break;
}
}


public function isFake(c):Boolean{
if(getSide(6)==c.getSide(6)||getSide(1)==c.getSide(1)||getSide(2)==c.getSide(2)){
return false;
}
else if(getSide(2)==c.getSide(4)||getSide(1)==c.getSide(5)||getSide(4)==c.getSide(2)||
getSide(5)==c.getSide(1)){
return false;
}
else{
return true;
}
}
}
```

Spatial Skills Game Code (Note: When you click on a cube, it checks the answer.)

```
count = 0;
tips.text = "Match the flat quadritiles to the constructed one shown above.";
startGame();
function startGame() {
    if (count == 20) {
        tips.text = "Thanks for your help!  That's all the quadritiles I need.";
    }
    var cube:Cube = new Cube();
    var colorful1 = new Color("_root.top");
    colorful1.setRGB(cube.getSide(6));
    var colorful2 = new Color("_root.left");
    colorful2.setRGB(cube.getSide(1));
    var colorful3 = new Color("_root.right");
    colorful3.setRGB(cube.getSide(3));
    answerNum = Math.floor(Math.random()*3+1);
```

```
if (answerNum == 1) {
	var colorful1 = new Color("_root.1top");
	colorful1.setRGB(cube.getSide(6));
	var colorful2 = new Color("_root.1lefttab");
	colorful2.setRGB(cube.getSide(1));
	var colorful3 = new Color("_root.1righttab");
	colorful3.setRGB(cube.getSide(2));
	var colorful4 = new Color("_root.1toptab");
	colorful4.setRGB(cube.getSide(3));
	var colorful5 = new Color("_root.1bottom");
	colorful5.setRGB(cube.getSide(4));
	var colorful6 = new Color("_root.1bottomtab");
	colorful6.setRGB(cube.getSide(5));
	//set up counterfeit cubes
	var fakecube1:Cube = new Cube();
	var fakecube2:Cube = new Cube();
	if (cube.isFake(fakecube1)) {
		//set the colors up
		var colorful1 = new Color("_root.2top");
		colorful1.setRGB(fakecube1.getSide(6));
		var colorful2 = new Color("_root.2lefttab");
		colorful2.setRGB(fakecube1.getSide(1));
		var colorful3 = new Color("_root.2righttab");
		colorful3.setRGB(fakecube1.getSide(2));
		var colorful4 = new Color("_root.2toptab");
		colorful4.setRGB(fakecube1.getSide(3));
		var colorful5 = new Color("_root.2bottom");
		colorful5.setRGB(fakecube1.getSide(4));
		var colorful6 = new Color("_root.2bottomtab");
		colorful6.setRGB(fakecube1.getSide(5));
	} else {
		fakecube1 = new Cube();
	}
	//set up counterfeit cubes
	if (cube.isFake(fakecube2)) {
		//set the colors up
		var colorful1 = new Color("_root.3top");
		colorful1.setRGB(fakecube2.getSide(6));
		var colorful2 = new Color("_root.3lefttab");
		colorful2.setRGB(fakecube2.getSide(1));
		var colorful3 = new Color("_root.3righttab");
		colorful3.setRGB(fakecube2.getSide(2));
		var colorful4 = new Color("_root.3toptab");
		colorful4.setRGB(fakecube2.getSide(3));
		var colorful5 = new Color("_root.3bottom");
		colorful5.setRGB(fakecube2.getSide(4));
```

```
        var colorful6 = new Color("_root.3bottomtab");
        colorful6.setRGB(fakecube2.getSide(5));
    } else {
        fakecube2 = new Cube();
    }
}
if (answerNum == 2) {
    var colorful1 = new Color("_root.2top");
    colorful1.setRGB(cube.getSide(6));
    var colorful2 = new Color("_root.2lefttab");
    colorful2.setRGB(cube.getSide(1));
    var colorful3 = new Color("_root.2righttab");
    colorful3.setRGB(cube.getSide(2));
    var colorful4 = new Color("_root.2toptab");
    colorful4.setRGB(cube.getSide(3));
    var colorful5 = new Color("_root.2bottom");
    colorful5.setRGB(cube.getSide(4));
    var colorful6 = new Color("_root.2bottomtab");
    colorful6.setRGB(cube.getSide(5));
    //set up counterfeit cubes
    var fakecube1:Cube = new Cube();
    var fakecube2:Cube = new Cube();
    if (cube.isFake(fakecube1)) {
        //set the colors up
        var colorful1 = new Color("_root.1top");
        colorful1.setRGB(fakecube1.getSide(6));
        var colorful2 = new Color("_root.1lefttab");
        colorful2.setRGB(fakecube1.getSide(1));
        var colorful3 = new Color("_root.1righttab");
        colorful3.setRGB(fakecube1.getSide(2));
        var colorful4 = new Color("_root.1toptab");
        colorful4.setRGB(fakecube1.getSide(3));
        var colorful5 = new Color("_root.1bottom");
        colorful5.setRGB(fakecube1.getSide(4));
        var colorful6 = new Color("_root.1bottomtab");
        colorful6.setRGB(fakecube1.getSide(5));
    } else {
        fakecube1 = new Cube();
    }
    if (cube.isFake(fakecube2)) {
        //set the colors up
        var colorful1 = new Color("_root.3top");
        colorful1.setRGB(fakecube2.getSide(6));
        var colorful2 = new Color("_root.3lefttab");
        colorful2.setRGB(fakecube2.getSide(1));
        var colorful3 = new Color("_root.3righttab");
```

```
		colorful3.setRGB(fakecube2.getSide(2));
		var colorful4 = new Color("_root.3toptab");
		colorful4.setRGB(fakecube2.getSide(3));
		var colorful5 = new Color("_root.3bottom");
		colorful5.setRGB(fakecube2.getSide(4));
		var colorful6 = new Color("_root.3bottomtab");
		colorful6.setRGB(fakecube2.getSide(5));
	} else {
		fakecube2 = new Cube();
	}
}
if (answerNum == 3) {
	var colorful1 = new Color("_root.3top");
	colorful1.setRGB(cube.getSide(6));
	var colorful2 = new Color("_root.3lefttab");
	colorful2.setRGB(cube.getSide(1));
	var colorful3 = new Color("_root.3righttab");
	colorful3.setRGB(cube.getSide(2));
	var colorful4 = new Color("_root.3toptab");
	colorful4.setRGB(cube.getSide(3));
	var colorful5 = new Color("_root.3bottom");
	colorful5.setRGB(cube.getSide(4));
	var colorful6 = new Color("_root.3bottomtab");
	colorful6.setRGB(cube.getSide(5));
	//set up counterfeit cubes
	var fakecube1:Cube = new Cube();
	var fakecube2:Cube = new Cube();
	if (cube.isFake(fakecube1)) {
		//set the colors up
		var colorful1 = new Color("_root.2top");
		colorful1.setRGB(fakecube1.getSide(6));
		var colorful2 = new Color("_root.2lefttab");
		colorful2.setRGB(fakecube1.getSide(1));
		var colorful3 = new Color("_root.2righttab");
		colorful3.setRGB(fakecube1.getSide(2));
		var colorful4 = new Color("_root.2toptab");
		colorful4.setRGB(fakecube1.getSide(3));
		var colorful5 = new Color("_root.2bottom");
		colorful5.setRGB(fakecube1.getSide(4));
		var colorful6 = new Color("_root.2bottomtab");
		colorful6.setRGB(fakecube1.getSide(5));
	} else {
		fakecube1 = new Cube();
	}
	//set up counterfeit cubes
	if (cube.isFake(fakecube2)) {
```

```
            //set the colors up
            var colorful1 = new Color("_root.1top");
            colorful1.setRGB(fakecube2.getSide(6));
            var colorful2 = new Color("_root.1lefttab");
            colorful2.setRGB(fakecube2.getSide(1));
            var colorful3 = new Color("_root.1righttab");
            colorful3.setRGB(fakecube2.getSide(2));
            var colorful4 = new Color("_root.1toptab");
            colorful4.setRGB(fakecube2.getSide(3));
            var colorful5 = new Color("_root.1bottom");
            colorful5.setRGB(fakecube2.getSide(4));
            var colorful6 = new Color("_root.1bottomtab");
            colorful6.setRGB(fakecube2.getSide(5));
        } else {
            fakecube2 = new Cube();
        }
    }
}
function checkAnswer(num) {
    if (num == answerNum) {
        tips.text = "Awesome!";
        count++;
        startGame();
    } else {
        tips.text = "Try to imagine folding up a paper cube if you're having
trouble.";
    }
}
```

Flash Cards Game Code (Note: When you click on the submit answer button, it checks the answer.)

```
stop();
completed = 0;
solution = 0;
mathProblem();
function mathProblem() {
    if (completed == 0) {
        tip.text = "Okay, so all you have to do is solve the math problem.  Type
your answer and then hit the green button to submit it.";
    }
    typeNum = Math.floor(Math.random()*5)+1;
    switch (typeNum) {
    case 1 :
        type.text = "How many bandages?";
        break;
```

```
case 2 :
        type.text = "How many bottles of medicine?";
        break;
case 3 :
        type.text = "How many weights?";
        break;
case 4 :
        type.text = "How many boxes of food?";
        break;
case 5 :
        type.text = "How many boxes of gloves?";
        break;
}
if (completed == 25) {
        tip.text = "Wow, thanks for all your help!  Everything's all sorted now.";
}
if (completed<=15) {
        diffVar = 10;
}
if (completed>15 && completed<=20) {
        diffVar = 100;
}
if (completed>20) {
        diffVar = 1000;
}
first1 = Math.floor(Math.random()*diffVar)+1;
second = Math.floor(Math.random()*diffVar)+1;
firstNum.text = first1;
secondNum.text = second;
opNum = Math.floor(Math.random()*4)+1;
switch (opNum) {
case 1 :
        solution = first1+second;
        operator.text = "+";
        break;
case 2 :
        operator.text = "-";
        if (first1<second) {
                swap = firstNum.text;
                firstNum.text = secondNum.text;
                secondNum.text = swap;
                solution = second-first1;
        } else {
                solution = first1-second;
        }
        break;
```

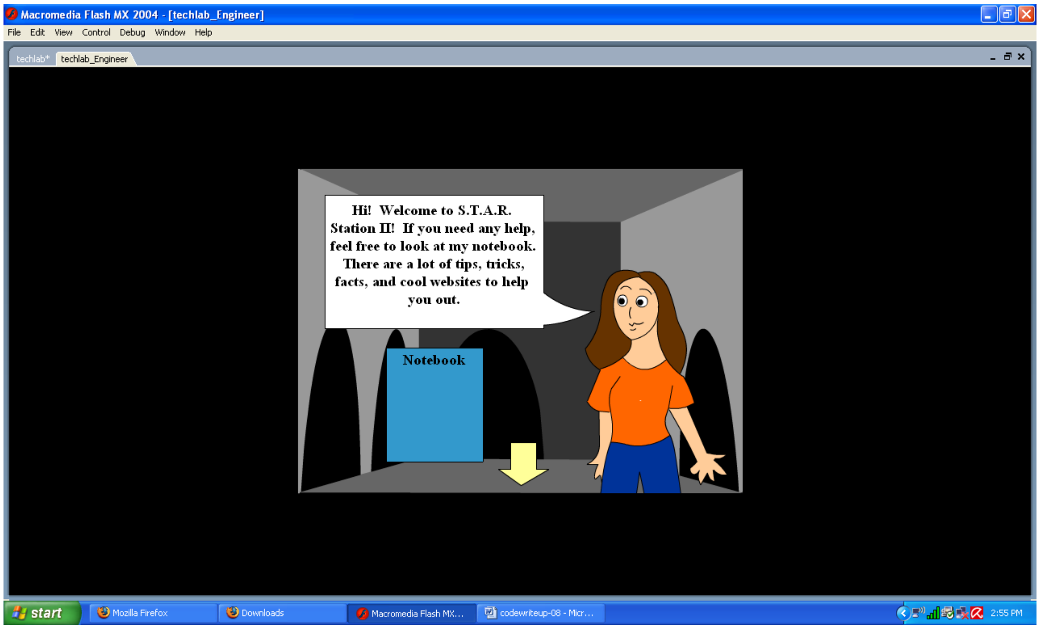
```
    case 3 :
        solution = first1*second;
        operator.text = "*";
        break;
    case 4 :
        solution = first1/second;
        operator.text = "/";
        if (first%second != 0) {
            mathProblem();
        }
        break;
    }
}
function checkAnswer() {
    if (input.text == solution) {
        completed++;
        trace(completed);
        tip.text = "Good job!";
        input.text = "";
        mathProblem();
    } else {
        trace("False. "+first1+operator.text+second+"="+solution);
        tip.text = "Try again.  If you're having trouble, try writing the problem
down on paper.";
        input.text = "";
        mathProblem();
    }
}
```

1. Date of this version of your program: 10-31-08
2. Project title: Math Edutainment Game for Girls Grades 1-6
3. Describe how your program runs as of this version.

    To run this program, you will need the techlab.swf file and the newest version of Flash Player. Double-click on the techlab.swf file to run. The program may take a while to load due to its graphic-intensive nature, but the loading bar will show you the progress.

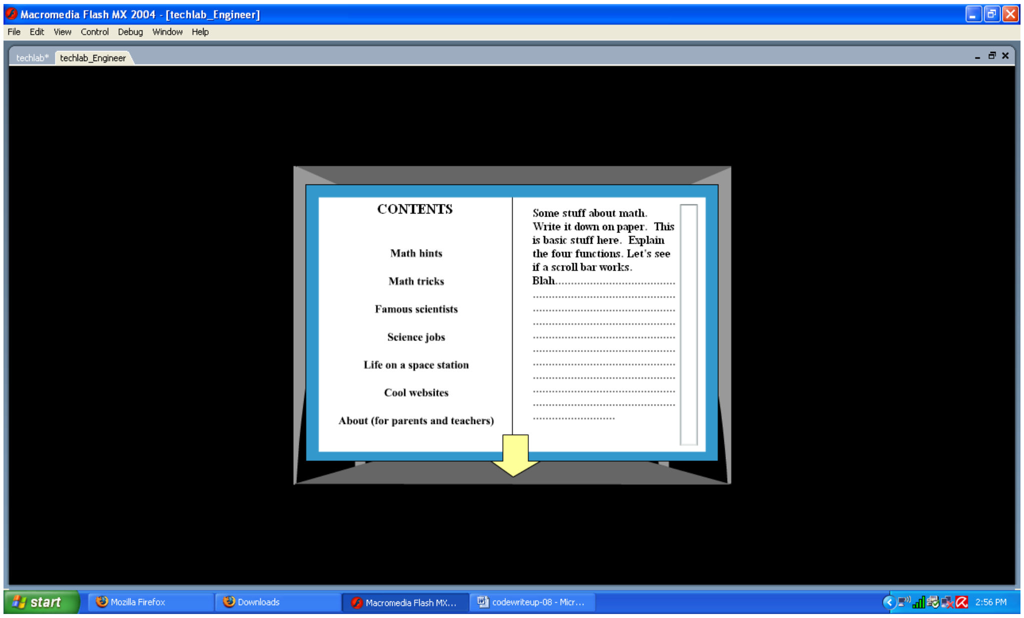
    After starting the program, create your character using the drop-and-drag components. I used a Movie Clip combined with a Button symbol to create these components. With a minimal amount of code I can create a relatively complex character creator. Once you are finished, click on the red arrow to advance. This “Next Scene” or “Back” Button symbol is a commonly used component of my program. Using ActionScript’s gotoAndPlay(“Scene”, frame) and gotoAndStop(“Scene”, frame) command, I have established a dynamic navigation system. Also note how the arrow changes in size when you scroll over it. Being able to create special properties for various stages of button interaction is a built-in property of Button symbols in Flash. Also note how many components become highlighted when they're scrolled over.

You will then see the main menu of the station. Click on the woman in the corner to be taken to the Engineer. You can "talk" with her (her text being set using the .text("") command with a dynamic text box) or click on her notebook. This will take you to another frame in that scene, which will display a notebook with several content links on the left-hand side. Clicking on one will display the content on the right-hand side. The right-hand side is a scrollable dynamic text box – scrollability is a built-in property of text box components in Flash.



Hi! Welcome to S.T.A.R. Station II! If you need any help, feel free to look at my notebook. There are a lot of tips, tricks, facts, and cool websites to help you out.

The Engineer


Macromedia Flash MX 2004 - [techlab_Engineer]
File Edit View Control Debug Window Help
techlab* techlab_Engineer
start
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Downloads
Macromedia Flash MX...
codewriteup-08 - Micr...
2:56 PM

CONTENTS

Math hints

Math tricks

Famous scientists

Science jobs

Life on a space station

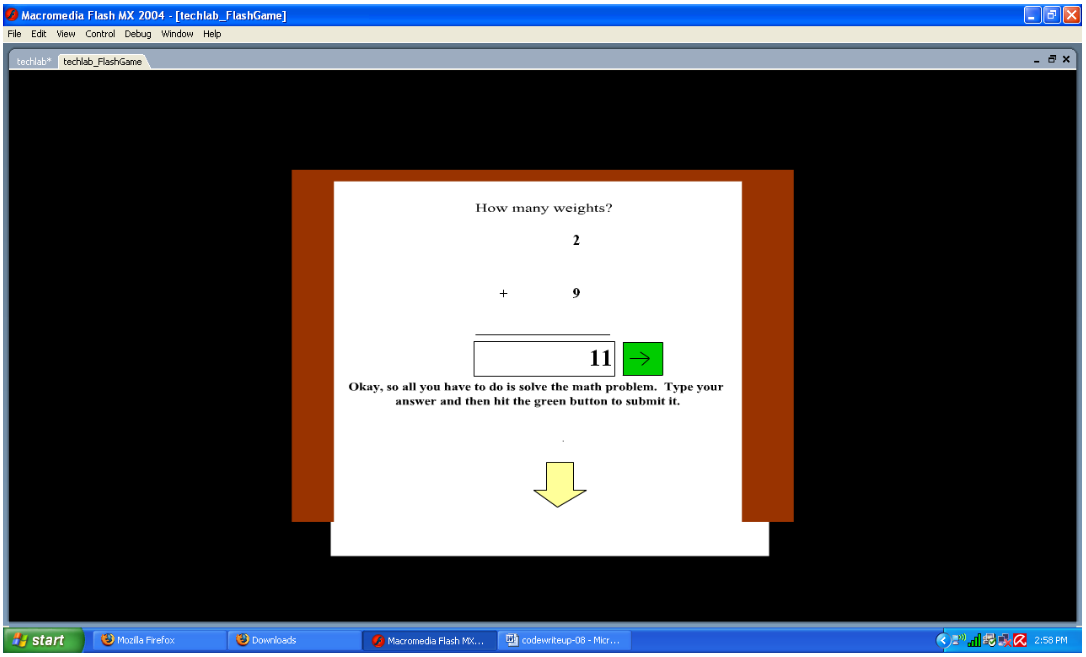
Cool websites

About (for parents and teachers)

Some stuff about math. Write it down on paper. This is basic stuff here. Explain the four functions. Let's see if a scroll bar works. Blah.......................................

Notebook

There are also two mini-games accessible from the main menu. One is the Flash Cards game. By clicking on the clipboard, you are given a simple math problem and some instructions. Read the (themed) problem and type your answer into the input text box component and click on the green button, which will then check the pre-calculated answer. If correct, your score will be increased and the game will progressively get harder. After correctly answering 25 problems, a completed game message will be displayed.


Macromedia Flash MX 2004 - [techlab_FlashGame]
File Edit View Control Debug Window Help
techlab* techlab_FlashGame
start
Mozilla Firefox
Downloads
Macromedia Flash MX...
codewriteup-08 - Micr...
2:58 PM

How many weights?

2

+ 9

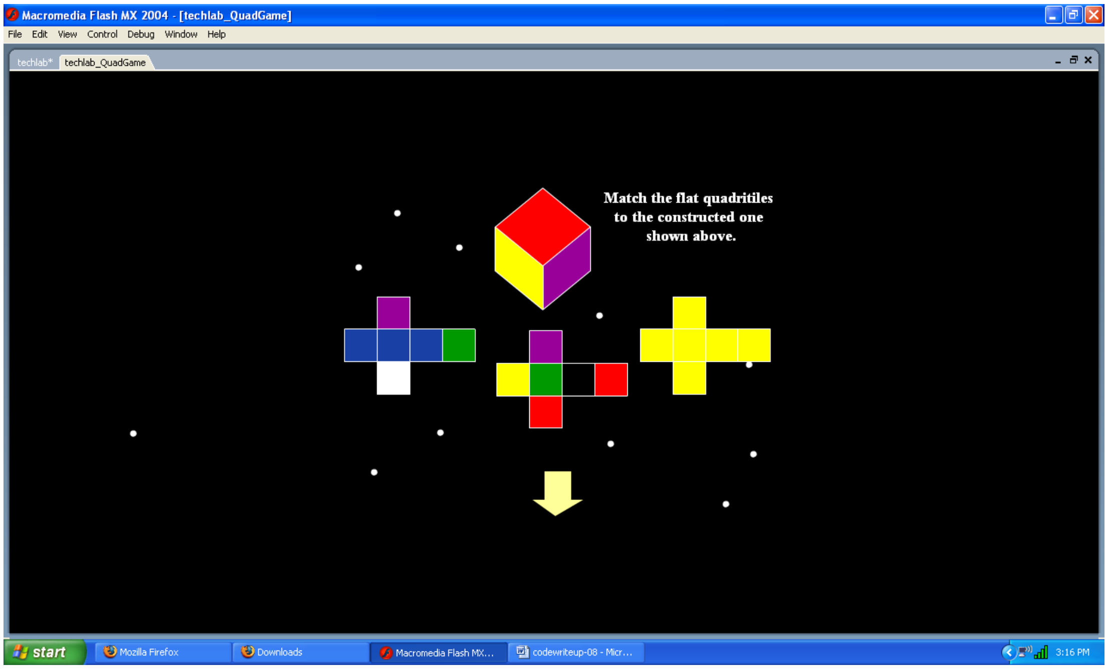
11

Okay, so all you have to do is solve the math problem. Type your answer and then hit the green button to submit it.

The Flash Cards Game

The other accessible game is the Spatial Skills game. By clicking on the scaffolding of the rocket, you will be given a screen with one “folded” cube and three unfolded cubes, as well as instructions. The “folded” cube is simply displaying three sides of the correct, stored cube. (Both the Cube and the Side are implemented in separate ActionScript classes.) After randomly generating the number of the correct cube and two other “fake” cubes, each face of each cube (a Movie Clip symbol) is displayed with a different color using the .setColor(“Hex Code String”) command. After clicking on the correct cube, your score is incremented. After answering 20 correct, a completed game message is shown. Unlike the Flash Cards game, this game does not get harder over time.

Luckily, this game does not have many input errors due to the nature of Flash. Input is almost all mouse input, minus the input box in the Flash Cards game. When an invalid answer is entered in this component, Flash recognizes this fact and displays the incorrect answer message regardless. All output is graphical – there is no writing to text files or anything of the sort. All of the components are currently working – all areas are accessible, the Flash Cards game can be played correctly, to completion, and without giving impossible problems or taking wrong answers – except for a minor bug in the Spatial Skills game. Sometimes the program does not randomly generate all of the cubes, leaving one unfolded cube in its default, pure-colored state (which, while not impeding the function of the game is certainly unsightly).



Match the flat quadritiles to the constructed one shown above.

Spatial Skills game bug – see the unfolded cube on the right.

4. What do you expect to work on next quarter, in relation to the goal of your project for the year?

   . In second quarter I plan to finish the other five mini-games, animate a few cut scenes, and flesh out the notebook feature with some common math tips and links to my research and a few girls in math and science websites.