

# Exploring Math With MicroWorlds EX

## Alignment With TEKS

### Grades 4 - 7

## Unit 1: Visualizing Math

### 1. Do It Yourself Word Problems

#### Description

Students create and illustrate word problems involving fractions, decimals or percents.

#### TEKS Standards Met

4.2(A)(C); 4.3(A); 4.4(B)(E); 4.14; 4.15; 4.16  
5.2(B); 5.3(A)(B)(C); 5.14; 5.15; 5.16;  
6.1(B); 6.2(A)(B)(C); 6.11; 6.12; 6.13;  
7.1(B); 7.2(A)(B)(C)(F)(G); 7.3(A); 7.13; 7.14; 7.15

### 2. Wiggles

#### Description

Students explore different combinations of straight lines and angles by writing simple procedures in order to discover that any combination of lines and angles, repeated enough times, forms a circular design.

#### TEKS Standards Met

4.8 (C); 4.9(A); 4.14; 4.15; 4.16;  
5.7(B); 5.1; 5.15; 5.16;  
6.6(A)(B); 6.11; 6.12; 6.13;  
7.6(B); 7.8(C); 7.13; 7.14; 7,15

### **3. Fraction Pies**

#### **Description**

Students create pie shapes divided into uniform slices and compare different pie shapes, determine the interior angle of each slice section, determine a formula for calculating angles of fraction pie shapes divided into uniform slices.

#### **TEKS Standards Met**

4.2(A)(C); 4.7; 4.14; 4.15; 4.16;  
5.2(A)(B); 5.5(A)(B); 5.6; 5.7(A); 5.8(B); 5.14; 5.15; 5.16  
6.1(B); 6.2(A); 6.4(B); 6.5; 6.6(C); 6.8(C); 6.11; 6.12; 6.13;  
7.2(A); 7.4(A) 7.13; 7.14; 7.15

### **4. 3D Boxes (in Extended Edition in PDF on CD)**

#### **Description**

Students create boxes consisting of small 3d cubes, controlling the boxes width, height, and depth with sliders. These boxes can be used to study one, two or three dimensions at a time, to study surface area or to create geometric art with a simulated 3D effect. Younger students benefit by using the pre-built cubes in the sample project to visualize the effects of changes in height, width or depth on area and volume.

#### **TEKS Standards Met**

#### **Using Print Materials/Tutorials to Develop Project**

5.3(B); 5.10; 5.11(A); 5.14; 5.15; 5.16;  
6.1(C); 6.4(B); 6.5; 6.8(A)(B); 6.11; 6.12; 6.13;  
7.2(F)(G); 7.3(B); 7.4(A); 7.5; 7.8; 7.9; 7.13; 7.14; 7.15

#### **TEKS Standards Met Using Supplied Sample**

4.4(A)(B); 4,6(A); 4.12; 4.14; 4.15; 4.16

## **Unit 2: Exploring Randomness with Art**

### **1. Flashy Math Art**

#### **Description**

Students create randomly drawn lines and angles and fill the areas formed with randomly selected colors.

#### **TEKS Standards Met**

4.3(A); 4.13(A); 4.14; 4.15; 4.16;  
5.3(A); 5.12; 5.14; 5.15; 5.16;  
6.5; 6.9(B); 6.11; 6.12; 6.13;  
7.2(F)(G); 7.10(B); 7.13; 7.14; 7.15

### **2. Random Geometr-Art**

#### **Description**

Students experiment with creating geometric designs and looking at how they differ based on the sequences of lines and angles and the number of repetitions

#### **TEKS Standards Met**

4.8 (C); 4.9(A); 4.14; 4.15; 4.16;  
5.7(B); 5.14; 5.15; 5.16;  
6.6(A)(B); 6.11; 6.12; 6.13;  
7.6(B); 7.8(C); 7.13; 7.14; 7,15

### **3. Mix It Up With the Music Randomizer**

#### **Description**

Students individually create measures of music with interesting rhythms and store them in a computer object (the MicroWorlds "turtle"). Then groups of students collaborate by placing these music-bearing objects together in one project in order to create music by combining randomly selected measures from randomly selected "turtles." Based on Mozart's Musical Dice Game.

#### **TEKS Standards Met**

4.13(A); 4.14; 4.15; 4.16;  
5.2(A)(B); 5.5(A); 5.12(B); 5.14; 5.15; 5.16;  
6.5; 6.9(B); 6.10(D); 6.11; 6.12; 6.13;  
7.13; 7.14; 7.15

## Unit 3: Exploring Geometric Shapes

### 1. Connect the Dots Coordinates-Style

#### Description

Students use coordinates to draw squares and rectangles.

#### TEKS Standards Met

4.8(B); 4.9(A); 4.10; 4.12; 4.14; 4.15; 4.16;  
5.7(A); 5.8; 5.9; 5.11; 5.14; 5.15; 5.16;  
6.3(C); 6.7; 6.8(B); 6.11; 6.12; 6.13;  
7.3(B); 7.4(A); 7.6(B)(D); 7.9; 7.13; 7.14; 7.15

### 2. Shape Up With Coordinates

#### Description

Students use coordinates to draw polygons of varying shapes and sizes (right, isosceles, triangles; parallelogram, trapezoid, isosceles trapezoid and rhombus) and analyze the polygons' attributes

#### TEKS Standards Met

5.7; 5.8; 5.9; 5.11(A); 5.14; 5.15; 5.16;  
6.4 (A); 6.7; 6.8(A)(B); 6.11; 6.12; 6.13;  
7.2(F)(G); 7.3(B); 7.4(A); 7.6(B)(D); 7.7; 7.9; 7.13; 7.14; 7.15

### **3. Coordinate-d Symmetry**

#### **Description**

Students use coordinates to draw a geometric shape or design with two lines of symmetry. Younger students will benefit by using the completed sample project to create symmetrical shapes and reflections.

#### **TEKS Standards Met**

#### **Using Print Materials/Tutorials to Develop Project**

5.7; 5.9; 5.14; 5.15; 5.16;  
6.5; 6.6(A)(B); 6.7; 6.11; 6.12; 6.13;  
7.7; 7.13; 7.14; 7.15

#### **TEKS Standards Met Using Supplied Samples**

4.8(B); 4.9(C); 4.15; 4.16

### **4. What a Star**

#### **Description**

Students explore a variety of star shapes and the relationship between a 5-pointed star and a pentagon in order to develop general rules for drawing polygons and stars. Younger students will benefit by using the completed sample project to explore various star shapes and the effects of changes of various attributes when running the star procedures.

#### **TEKS Standards Met**

#### **Using Print Materials/Tutorials to Develop Project**

5.3(B)(C); 5.5(B); 5.6; 5.7; 5.14; 5.15; 5.16;  
6.2(C); 6.4; 6.5; 6.6(A)(B); 6.8(A); 6.11; 6.12; 6.13;  
7.2(F)(G); 7.3(B); 7.4(A); 7.5; 7.6(A)(B)(D); 7.13; 7.14; 7.15

#### **TEKS Standards Met Using Supplied Samples**

4.8(A)(C); 4.14; 4.15; 4.16

## Unit 4: Exploring Math Patterns

### 1. Multiple Patterns

#### Description

Students create an interactive pictorial model representing multiples of different numbers in order to analyze these multiples by comparing the different patterns they generate.

#### TEKS Standards Met

4.3(A); 4.4(A)(B); 4.5(B); 4.6; 4.7; 4.14; 4.15; 4.16;  
5.3(B)(C)(D); 5.5(B)(C); 5.6; 5.14; 5.15; 5.16;  
6.1(C)(E); 6.2(C); 6.4(A); 6.5; 6.11; 6.12; 6.13;  
7.2(C)(F)(G); 7.4(C); 7.13; 7.14; 7.15

### 2. Mathematical Music

#### Description

Students learn about and apply knowledge of math patterns to create musical chord sequences and use variables to develop a mathematical formula to create chord sequences starting on any note.

#### TEKS Standards Met

4.3(A); 4.7; 4.14; 4.15; 4.16;  
5.3(A); 5.6; 5.14; 5.15; 5.16;  
6.1(C); 6.4; 6.5; 6.11; 6.12; 6.13;  
7.2(C); 7.4(A)(C); 7.5; 7.13; 7.14; 7.15

## Unit 5: Exploring Probability

### 1. Coin Flipper

#### **Description**

Students set up a project for conducting coin-flipping experiments and recording the outcomes and then analyze the data as the computer repeatedly flips a virtual coin. Younger students benefit by using the completed sample to set up coin-flipping experiments, predict what the results will be, run the experiments and then view the actual results and a graph of the results on a pie-graph to see how accurate their predictions are.

#### **TEKS Standards Met**

#### **Using Print Materials/Tutorials to Develop Project**

5.6; 5.12; 5.13(B)(C); 5.14; 5.15; 5.16;  
6.3 (B)(C); 6.5; 6.9; 6.10(C)(D); 6.11; 6.12; 6.13;  
7.11; 7.13; 7.14; 7.15

#### **TEKS Standards Met Using Supplied Sample**

4.13(A)(B); 4.15; 4.16



## **2. Double Coin Flipper**

### **Description**

Students collect, record and analyze data as the computer repeatedly flips two virtual coins. Younger students benefit by using the completed sample to set up coin-flipping experiments with two coins, predict what the results will be, run the experiments and then view the actual results and a graph of the results on a pie-graph to see how accurate their predictions are.

### **TEKS Standards Met**

#### **Using Print Materials/Tutorials to Develop Project**

5.6; 5.12; 5.13(B)(C); 5.14; 5.15; 5.16;  
6.3 (B)(C); 6.5; 6.9(A); 6.10(C)(D); 6.11; 6.12; 6.13;  
7.2 (F)(G); 7.10; 7.11; 7.13; 7.14; 7.15

#### **TEKS Standards Met Using Supplied Sample**

4.13(A)(B); 4.15; 4.16

### **3. Funny Dice**

#### **Description**

Students formulate and test predictions about dice roll probabilities with altered dice. All students, including younger students, benefit by using the supplied samples to predict both the range of results and the actual results when either three dice (Funny Dice sample) or six dice (More Funny Dice sample) are “virtually” rolled up to 1000 times and their face values totalled.

#### **TEKS Standards Met**

##### **Using Print Materials/Tutorials to Develop Project**

5.5(A)(B); 5.6; 5.12; 5.13; 5.14; 5.15; 5.16;  
6.3; 6.5; 6.9; 6.10(A)(B)(D); 6.11; 6.12; 6.13;  
7.3(A); 7.10; 7.11; 7.12; 7.13; 7.14; 7.15

##### **TEKS Standards Met Using Supplied Samples**

4.3(A); 4.7; 4.13; 4.14; 4.15; 4.16

## **Unit 6: Exploring Math Through Games and Math Machines**

### **1. Division Machine**

#### **Description**

Students create a "division machine" which converts fractions to decimals and to long division answers with remainders. Students also explore repeating decimals.

#### **TEKS Standards Met**

4.2(D); 4.4(B)(E); 4.14; 4.15; 4.16;  
5.2; 5.3 (C); 5.5(B); 5.6; 5.14; 5.15; 5.16;  
6.1(B); 6.2(D); 6.3(A); 6.11; 6.12; 6.13;  
7.1(B); 7.2(A)(B); 7.13; 7.14; 7.15

### **2. Number Lines from 0 to 1 (in Extended Edition in PDF on CD)**

#### **Description**

Students create a game environment for strengthening skills in locating fractions, decimals, and percents on number lines. Younger students benefit by exploring the completed game sample.

#### **TEKS Standards Met**

#### **Using Print Materials/Tutorials to Develop Project**

5.2; 5.5(B); 5.14(B)(C)(D); 5.15; 5.16;  
6.1(B); 6.2(B)(C); 6.3(B); 6.4(B); 6.5; 6.11; 6.12; 6.13;  
7.1(B); 7.2(A); **7.3; 7.4(A); 7.13; 7.14; 7.15**

#### **TEKS Standards Met Using Supplied Sample**

4.2(A)(C)(D); 4.14(D); 4.15; 4.16

### **3. Create a Board Game (in Extended Edition in PDF on CD)**

#### **Description**

Students create a "digital board game for practicing multiplication and division with large numbers. Simple adaptations to the completed sample make it an interesting and challenging game that younger students can use to practice addition and subtraction as well as multiplication and division.

#### **TEKS Standards Met**

##### **Using Print Materials/Tutorials to Develop Project**

5.3(A)(B)(C); 5.4(A); 5.13; 5.15; 5.16;  
6.2(B); 6.5; 6.11; 6.13;  
7.2(A)(B)(F)(G); 7.13; 7.14; 7.15

#### **TEKS Standards Met Using Supplied Sample**

4.2(A)(C)(D); 4.14(D); 4.15; 4.16

### **4. Function Machine (in Extended Edition in PDF on CD)**

#### **Description**

Students create a function machine that selects operations and secret numbers at random. They apply mental math strategies while analyzing inputs and outputs to determine hidden functions. Younger students can play the completed game available in the sample project.

#### **TEKS Standards Met**

##### **Using Print Materials/Tutorials to Develop Project**

5.3(A)(B)(C); 5.4; 5.5(A)(B); 5.6; 5.14; 5.15; 5.16;  
6.2(B)(C)(D); 6.4(A); 6.5; 6.11; 6.12; 6.13;  
7.2(A)(B)(C)(F)(G); 7.3(A); 7.4(A)(B); 7.5(A); 7.13; 7.14; 7.15

#### **TEKS Standards Met Using Supplied Sample**

4.3(A); 4.4(D); 4.5; 4.6(A); 4.14; 4.15; 4.16