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Venn Diagrams

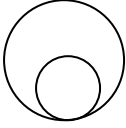
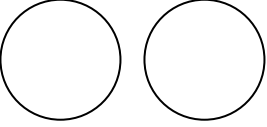
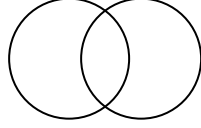
The Flash Venn Diagrams project allows you to explore the relationships between sets of objects. You can morph the project in any number of ways. Your starter project sets up a game that presents the relationship between two sets in three possible ways: one as subset of the other, two disjointed sets, and overlapping sets.

Opportunity 1 provides a description of how these three different types of relationships are programmed. Study it and then work from it to morph the application.

Opportunity 2 provides a way, given two premises, of determining in the conclusion is true or false by drawing Venn diagrams.

Opportunity 3 makes it so that you can figure out the relationships between three sets of objects.

Opportunity 1

<p>Given two sets, determine the appropriate relationship between the two and move the circles appropriately.</p> <p>Subsets</p>  <p>Example: Mammals and Whales</p> <p>Disjoint</p>  <p>Example: Dogs and Cats</p> <p>Overlapping</p>  <p>Example: Nurses and Women</p>	<p>Try these problem:</p> <ol style="list-style-type: none">1. Democrats and Republicans2. Words and Verbs3. Smoker and Non-smoker4. Teachers and Men5. Real Numbers and Rational Numbers6. Nobel Winners and Pulitzer Winners7. Fish and Mammals8. Math Class and Algebra Class9. Animals that Fly and Birds <p>Answers:</p> <p>Subsets: 2, 5, 8</p> <p>Disjoint: 1, 3, 7</p> <p>Overlapping: 4, 6, 9</p>
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How Opportunity 1 is Coded

Start with two circles. Here is the some code to draw a circle on the stage, borrowed from the VennCircle.as file:

```
public function drawCircle() : void {  
  
    this.graphics.clear();  
    this.graphics.beginFill(insideColor);  
    this.graphics.lineStyle(1, outsideColor);  
    this.graphics.drawCircle(position.x, position.y, radius);  
    this.graphics.endFill();  
}
```

In the starter application, you programmed this with the following function:

```
private function calculateOverlap(cir1:VennCircle, cir2:VennCircle):int {
```

```
var pt1:Point = cir1.getPosition();
var pt2:Point = cir2.getPosition();
var rad1:int = cir1.getRadius();
var rad2:int = cir2.getRadius();

var retVal:int = NONE;

if ((Math.pow(pt1.x - pt2.x, 2) +
Math.pow(pt1.y - pt2.y, 2)) <
(Math.pow(rad1 + rad2, 2))) {

    retVal = PARTIAL;

    // The two circles overlap, now we need to check and
    // see if one is completely inside of the other one
    if ((Math.pow(pt1.x - pt2.x, 2) +
Math.pow(pt1.y - pt2.y, 2)) <
(Math.pow(rad1 - rad2, 2))) {

        retVal = FULL;

        if (rad1 < rad2) {
            retVal = FULL;
        } else {
            retVal = PARTIAL;
        }
    }
} else {
    retVal = NONE;
}

return retVal;
}
}
```

Opportunity 2

Consider the situation in which you have three sets of objects. Draw a Venn Diagram to represent the relationships.

Example: Given the three sets: Women, Dentists, and Teachers

A = Women

B = Dentists

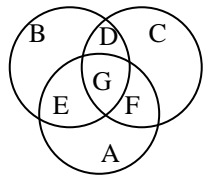
C = Teachers

D = Teachers who are also Dentists

E = Women Dentists

F = Women Teachers

G = Women Teachers who are also Dentists



Try this problem:

Using the sets of colors (red, blue, and green) and the sets of resulting colors if combinations of two colors are mixed, create a Venn Diagram.

Solution:

Combination	Result
Red-green	Yellow
Red-blue	Purple (magenta)
Blue-green	Light Blue (cyan)

Answer:



How Opportunity 2 is Coded

In the code we can adjust the number of circles that can by changing this line of code:

```
public class Board extends MovieClip {
    private var NUM_CIRCLES:int = 3;
```

....

}

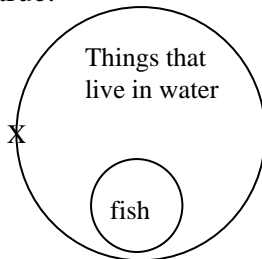
Opportunity 3

Given two premises (P), determine if the conclusion (C) is true or false by drawing Venn Diagrams, labeling the diagrams, and marking the second premise with an X.

The X will go on the circle of the second premise if it is false and in the circle if it is true.

Example:

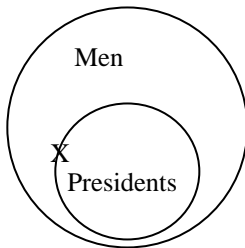
- P: All fish live in the water
- P: Whales are not fish
- C: Whales do not live in water



Answer: False. The X goes on the circle of the outer circle because we are not told that whales live in water or not, only that they are not fish.

Example:

- P: All 20th-century US presidents were men
- P: Albert Einstein was a man.
- C: Albert Einstein was a 20th-century US president.



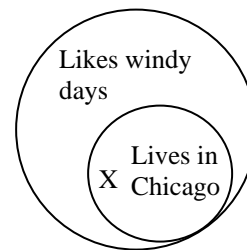
Answer: False. The X goes on the inner circle because Einstein is a man, but we were not told if he was a president.

Try this problem:

- P: If a person lives in Chicago, then the person likes windy days.
- P: Carlos lives in Chicago.
- C: Carlos likes windy days.

Solution:

The outer circle is labeled "Likes windy days" and the inner circle is labeled "Lives in Chicago."



Answer: True. Carlos likes windy days because we are told that people who live in Chicago like windy days and we are told that Carlos lives in Chicago. The X goes inside the inner circle.