Opening Exercise

Last time, we created a Die class with a roll() method.

Write a bit of code to get two rolls where the second roll is different from the first.

```java
> Die d = new Die( 6 );
> d.uniqueRolls();
Rolls: 2 5
```
Exercise: Improving Our Solution

In our first version, we produce only two unique rolls.

Modify your solution so that it can produce any number of rolls where all of the rolls are unique.

> java Die
  18 38 25 44 42
Lesson 1 from This Exercise

Solve a simple case first.
Simple code is easier to write than complex code.

If you want an arbitrary number of unique rolls, solve the case of two unique rolls.
Lesson 2 from This Exercise

*Use your simple solution to solve the general case.*

*The general solution almost always contains a kernel of the simple solution.*

```java
for ( int i = 0; i < count; i++ )
{
    int roll = this.roll();
    while ( isRepeat(roll, result, i) )
    {
        roll = this.roll();
    }
    result[i] = roll;
}
```
Lesson 3 from This Exercise

*Nested loops can be complicated.*
*Creating a helper method can make it easier to write the code — and read, too!*

```java
for ( int i = 0; i < count; i++ )
{
    int roll = this.roll();
    while ( isRepeat(roll, result, i) )
        roll = this.roll();
    result[i] = roll;
}
```
A File is ...

a place for your stuff
Data Compression and Files

This is what I showed to demonstrate compression:

But this isn't actually how our data compression for Sound worked.
Our Sound Compression

It did this:

To save our DiffSound objects, we need to write them to a file.
How to Write to a File

A simple way of writing a file is:

1. Create a file object.
2. Write data to it using its `write()` and `newLine()` methods.
3. Close the file.

#2 and #3 are just like what we've done in the past. #1 requires a "trust me" moment or two — for now.
Our Compressed File

... is bigger than the original!

Why?
Our Compressed File

FileWriters are for creating text files, and text is an inefficient encoding!

This semester, we will spend our time dealing with text as our third medium.

To save our data in a more compact format, we will have to learn about another kind of file object — in CS II, or by our own research!
Quick Exercise

Before now, we have mirrored pictures and sounds.

Write a bit of code to mirror a String.

For example:
"Eugene Wallingford is the finest CS I instructor I know."
gives
".wonk I rotcurtsni I SC tsenif eht si drofgnillaW eneguE"