J10 Number and Autoboxing

Number, Integer, Short, Float, etc.
Autoboxing
Math

The Number Classes

Normally you will represent numbers with the **primitive** types `int`, `short`, `float`, etc.
Java includes 'boxed' object analogues to each of these: `Integer`, `Short`, `Float`, etc.

- Number classes have methods (primitives don't)
  - `toString()`, `parseInt()`, etc.
- Number classes have constants
  - `Integer.MIN_VALUE`, `Short.MAX_VALUE`, etc
- Number classes have a space overhead
  - They are instantiated as true objects

Autoboxing

Classes such as `Integer` and `Character` are *boxed* versions of the primitive types `int` and `char` (primatives *wrapped* in an object). Java offers automatic support (syntactic sugar) for boxing and unboxing (wrapping / unwrapping).

- Boxing an `int` literal: `Integer i = 5;`

- Unboxing to an `int` variable: `int j = i;`

The `Math` class

The `Math` class contains methods and constants useful for basic mathematics:

- Constants: `Math.PI`, `Math.E`
- Trigonometry: `sin()`, `cos()`, etc.
- Rounding: `abs()`, `ceil()`, `floor()`, etc.
- Comparison functions: `max()`, `min()`
- Exponentials and logs: `exp()`, `log()`, `pow()`, etc.
- Random number generation: `random()`