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- Let's look at some interclass problem solutions.
- What caused you difficulties when you were doing this problem?
- Difficulties with doTogether.
- What problems might you run into if I asked you to do a long animation using the same style of coding you did for this?
- Quotes from book:
  - "Great things can be reduced to small things, and small things can be reduced to nothing." - Chinese Proverb
  - "Weeks of programming can save you hours of planning." - Anonymous

Problem Decomposition

- One of the most basic skills you should learn in this class is that of problem decomposition. This is perhaps the most fundamental skill in CS and a great benefit to all facets of life.
- The idea is simple. Solving big problems is hard, but solving little problems is easy. So you break big problems into little ones and solve them independently.
- The book uses term "divide and conquer". I'm not big on this because this term has a specific meaning that we might see later in the semester.

- The way you decompose problems in Alice is by creating new methods.
- Methods are basically collections of statements that you can call.
- You have been calling methods already so that is nothing new.
- The new aspect of this is that you can make methods where you can put collections of statements that you will be calling frequently, or just to break the problem into more manageable pieces.

- Top level decomposition should likely be done with world methods. Basically, any method that is going to alter the state of multiple objects should probably go into the world.
- Your book is really big on the analogy of making a film and talks about methods named by scenes or shots. I'm not a fan of this. I like method names that carry more information. That also makes them more general.
- Rule of Thumb: methods should not be longer than what you can see on the screen. This really helps to reduce errors.

- My own rule of thumb in CS is that if you are doing things properly, you never do anything complex.
- More to the point, if you have something that is complex, always try to break it into pieces that are simple. It is much harder to mess up things that are simple.
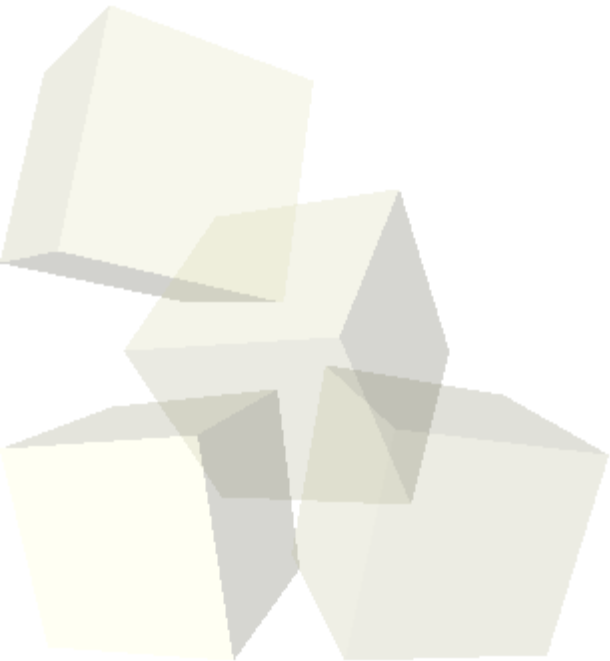
- Another block type that you can add to Alice is a comment block.
- Comments don't do anything, they simply allow you to type in a description of what is happening.
- You should also consider putting comments in your programs that say you are the author.

- Let's do something in Alice where we can make use of methods.

- The rule of thumb for keeping methods short is actually based on real research and is generally valid for all programming languages. Why do you think this matters?
- Interclass Problem – Take your solution to the problem you did for today and repeat it where you break it into multiple methods.