**Announcements**

- Read Chapter 9, Sec 2 for next time
- Assignment 6 due next Tuesday
- Today
  - Chapter 9, Section 1 – Lists
  - Show Halloween card….

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**Collections**

- In some animations, several objects must perform the same actions
  - Example: marching band marching
- It is convenient to collect all objects into a group (collection)
  - Major benefit – write code for all the objects in the group (rather than separate code for each object)

**List**

- A list - one way to organize objects into a collection
  - You may use lists to organize
    - Shopping list
    - Todo list
- In programming, a list is a collection of objects or information. We call an organizing structure a **data structure**.
Creating Lists

- In Alice, a list can be a list of numbers, or a list of objects, or a list of colors, etc.
- Let’s create a list of skeletons

Programming with a List

- Can “iterate through a list”
  - Do something to each item in the list
    - In order (use “For all in order”)
    - All together (use “For all together”)

Example/Demo: Iteration in Order

For each skeleton in order
skeleton says “Boo”
For each skeleton in order
skeleton turns its head around
Applying a Part of an object

- Drag in skeleton turn
- Select part
- Drag over part
- Drag in item
- Type in part

Example/Demo: Iteration Together

For all skeleton together
skeleton says “Boo”
For all skeleton in together
skeleton turns its head and neck around

List Questions

- What are differences between For all in order and For all together?
- When would you want to use each of them?
- What can you put in a list?
- When can you refer to a part of an object in a list?

Classwork today

- Create a list of players
- Make them do several things.