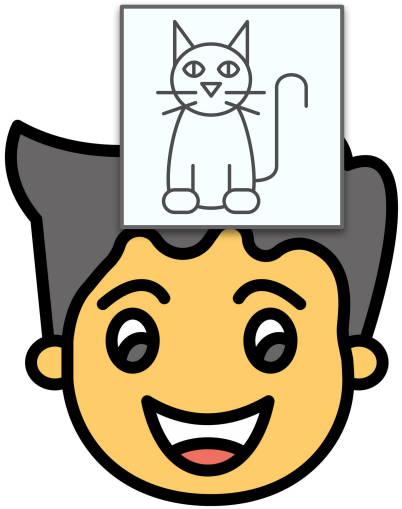
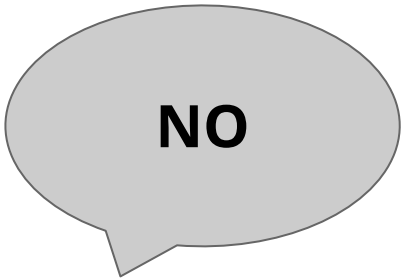
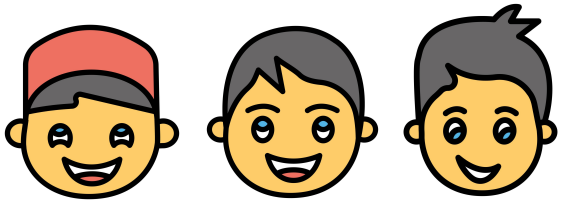
Celebrity Heads
Just add Computer Science!







What do Decision trees do?

We can use them for classifying things!

You just need to ask a series of Yes/No questions to narrow down the possible answers. A decision tree where every question has only two options (like yes/no), is called a binary tree.









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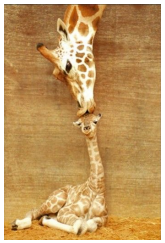
What questions do you need to ask to figure out

What animal am I thinking of?

as quickly as possible?






What animal am I thinking of?

Does it have hair/fur?

YES

NO

Could you keep it as a pet?

Does it have feathers?

YES

NO

YES

NO

Is it a cat?

Is it a Giraffe ?

Is it a farm animal ?

Does it have legs ?

YES

NO

YES

NO

YES

NO

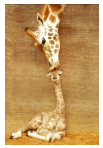
YES

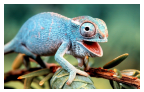
NO

Is it a reptile?

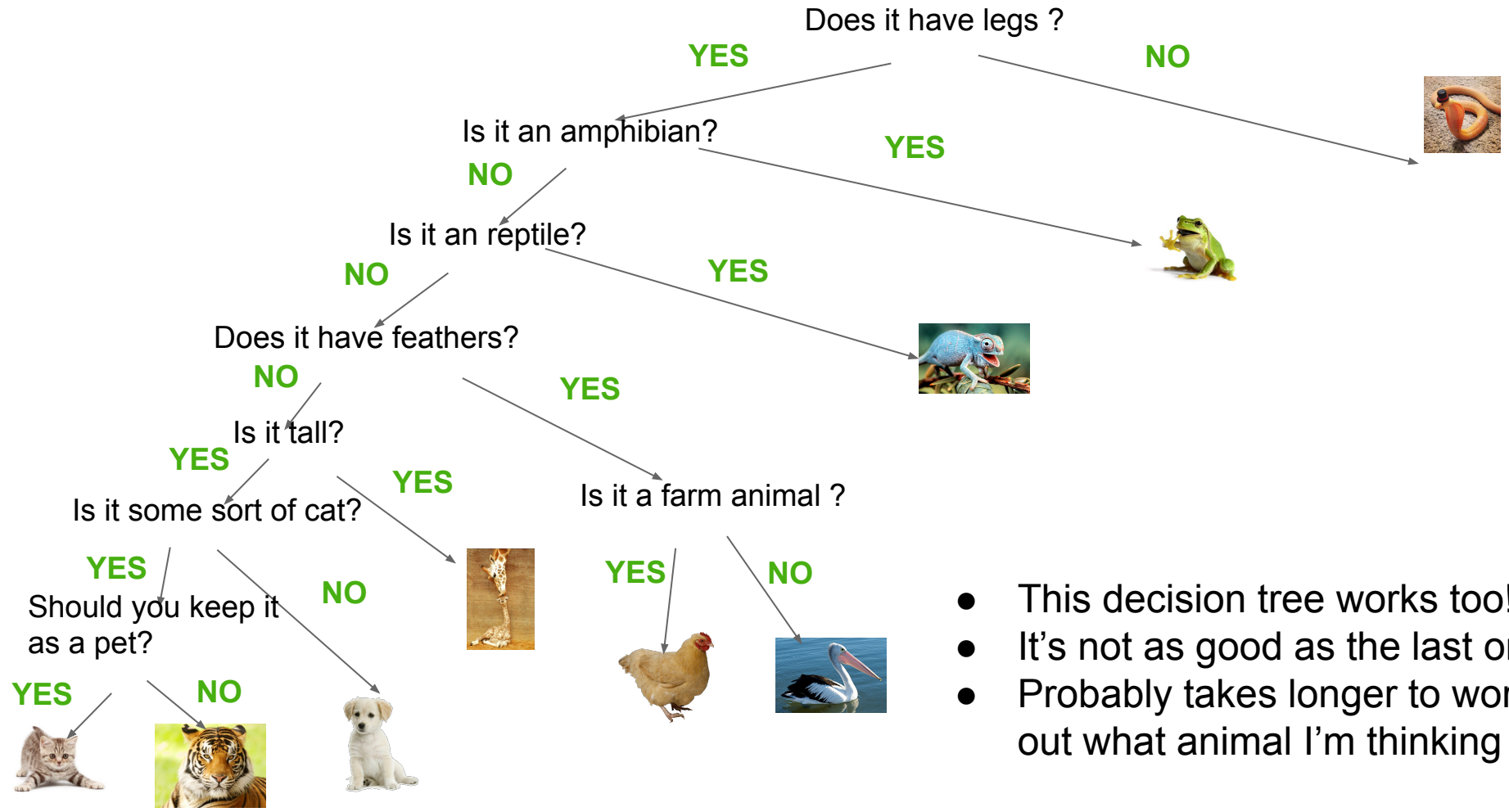
YES

NO





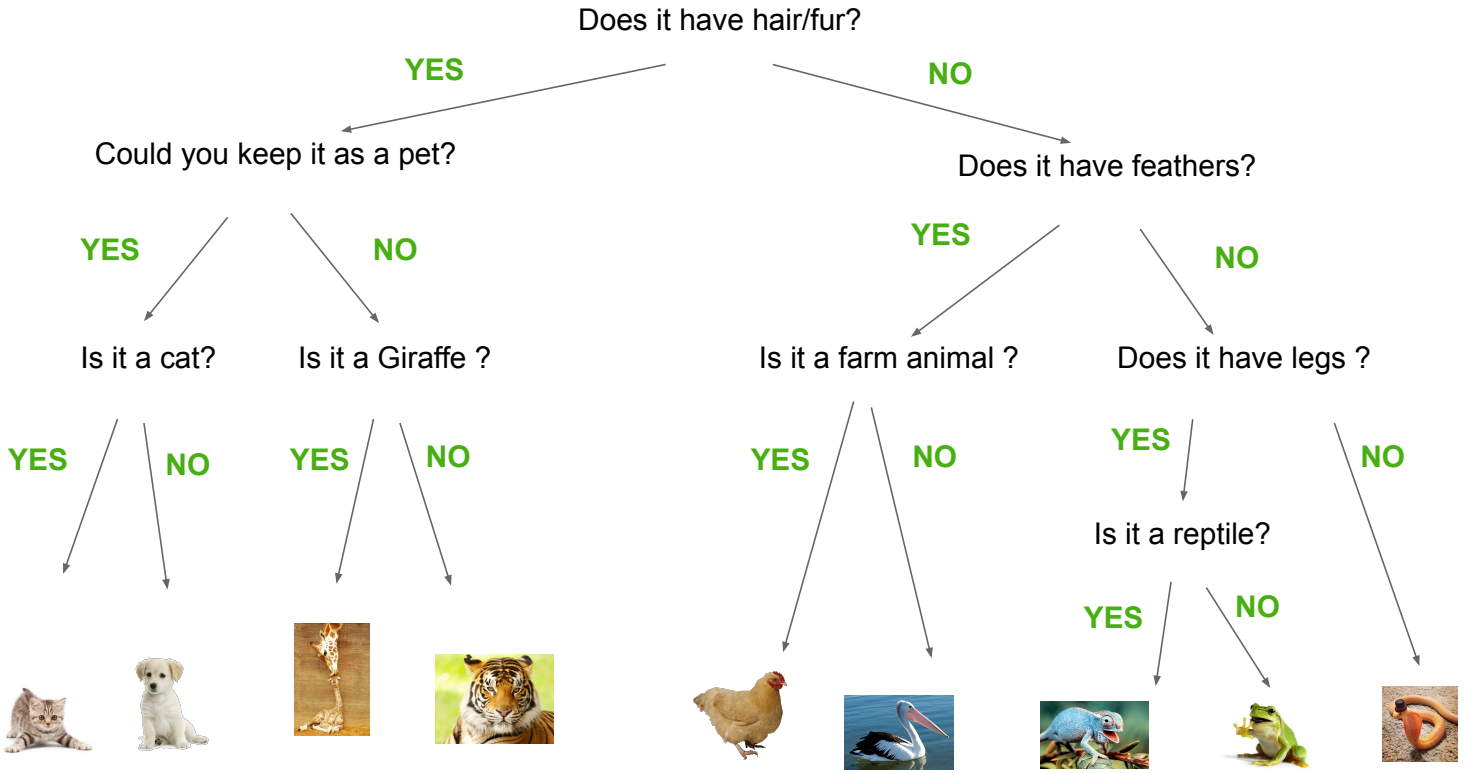
What animal am I thinking of?



- This decision tree works too!
- It's not as good as the last one
- Probably takes longer to work out what animal I'm thinking of!

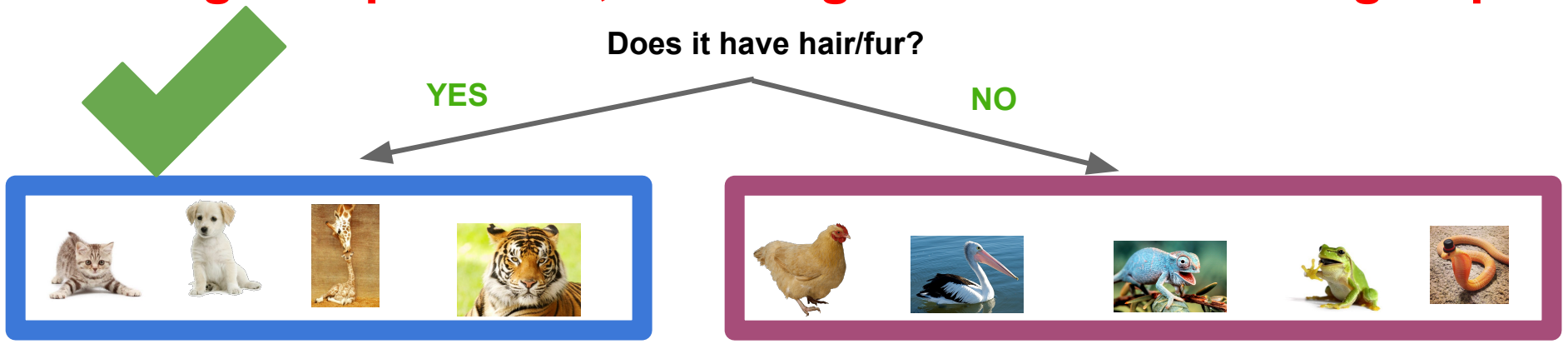
So how do we build a good tree?

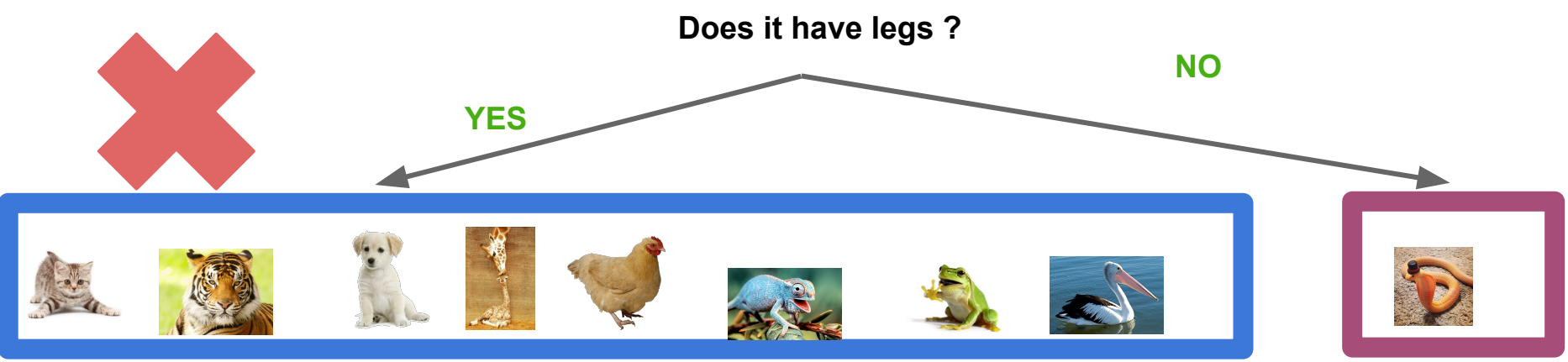
- Nice and even! (This is called a balanced tree)
- Every question splits the animals in half and rules out half the animals
- Gets to final animal faster



So how do we build a good tree??

Ask good questions, at the right time to halve the group





So how do we build a good tree??

Does it have hair/fur?

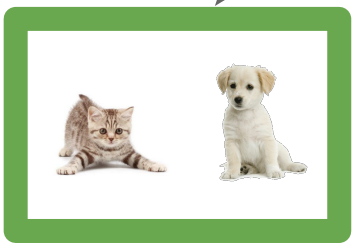
YES

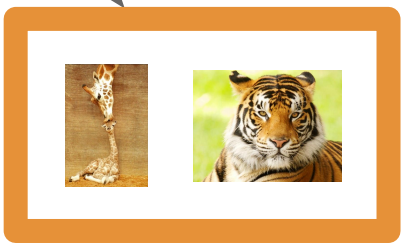
NO

Could you keep it as a pet?

YES

NO





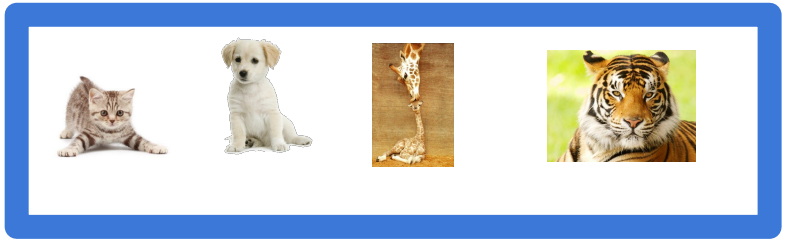
Repeat for each half!

Now you've ruled some out maybe some different questions are useful.

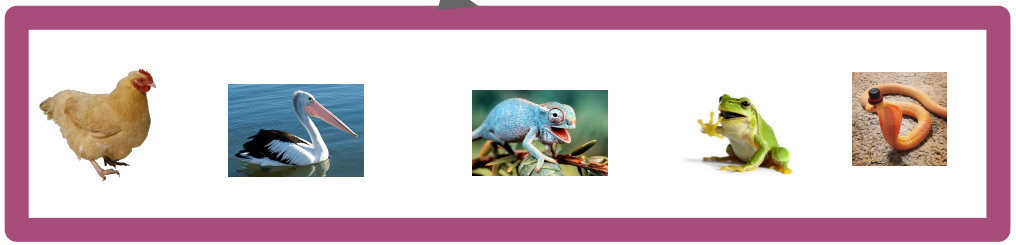
So how do we build a good tree??

Does it have hair/fur?

YES



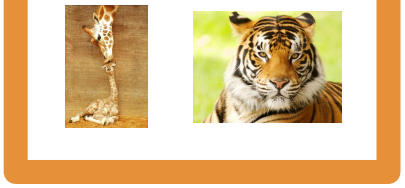
NO



Could you keep it as a pet?

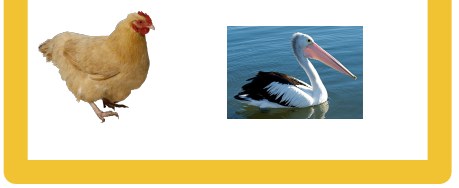
YES

NO

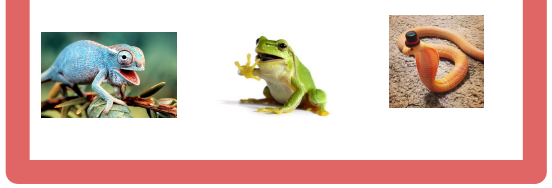


Does it have feathers?

YES



NO



What are we going to do?

- Each team gets a pack of Celebrity Heads cards.
- There are 18 cards with information about the characters.
- There are 2 packs to try

Dog

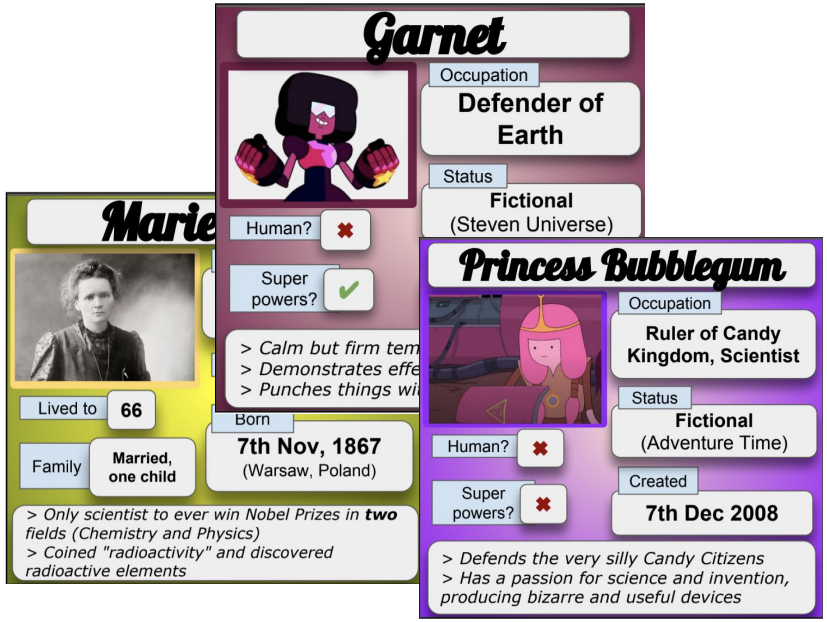
Type: Animal
Class: Mammal (Place
Home: House pet

Sunflower

Type: Plant
Feature: Flowers
Home: Wild or a garden

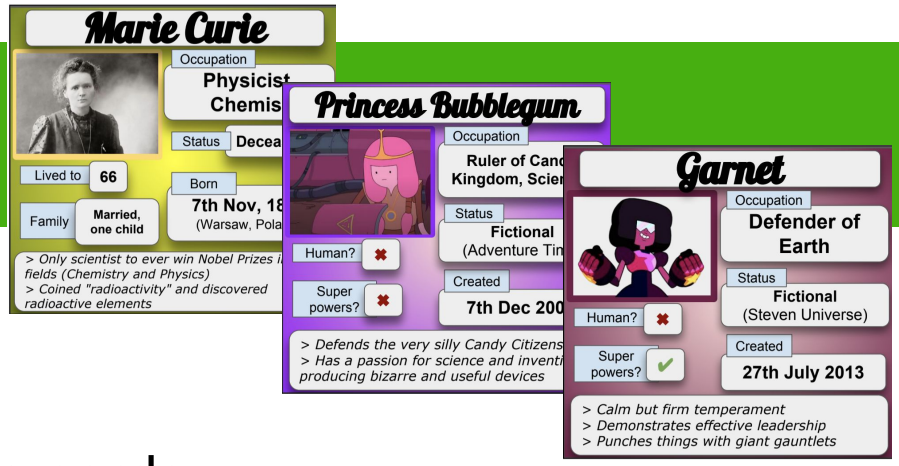
Apple

Type: Plant
Feature: Fruit
Home: Kitchen or farm



- **Your task is to look at the information on the cards and make a Celebrity Heads algorithm decision tree!**

How do we do it?

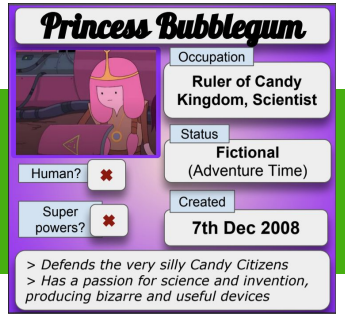


- **Look** at the information on the cards
- **Start at the top** and decide a question that will split the group of celebrities in half. The answer for the question is YES or NO
- Repeat **for each of the halves** you just made
- Gradually split it down until each group has only one left - write the character at the bottom of that branch

Remember - make a balanced tree!

- Ask **good questions** that will split the group in half
- Make your tree as **flat and even** as possible

How to play?



When you've finished building your Celebrity Heads algorithm decision tree …

- Someone picks a card at random (don't look at it!)
- If they want to, stick it to their forehead like in Celebrity Heads!
- That person asks your group the questions on your decision tree to work out which character they are
- Count how many questions they had to ask to work it out - the lower the better!

You can call a tutor over to play your game!

Let's do it

- Get into groups of 3 - 5
- Each group gets:
  - 1 sheet butchers paper
  - Markers
  - Student instruction sheet
  - First card set
- Create your decision tree - write it on the paper
- Test it out then call a tutor over to play it

Ask a tutor if you get stuck!

- Grab the second (harder) card set and another sheet of paper
- Do it agan!