Candy Decision Tree Physical Implementation

Day 1: 55 minutes

Required materials:
- Printout of 8 candies or 8 different physical candies for each group of four
  - What I had was four candies that were chocolate, and four that were not, but anything will work
- 8 notecards / sticky notes for each group
- Your preferred way to make decision trees
  - Butcher paper
  - Markers
  - Dry erase markers
  - Large post-it notes
  - White boards
  - Sidewalk chalk outside

Activation:
- Start by asking students what their science teacher would be looking for if they asked students to describe the features of a bird (Color, beak shape, size, etc.)
- Using one index card per piece of candy, ask the students to write down the features of each piece of candy.
- Have students create their root node and links (***Display picture that is at the end of this document***). Tell them to write the word "Yes" by the line going down to the left and the word "No" by the line going down to the right.
- Ask each group to develop a question that uses their features to split the candy into two equal groups. Have each group move each candy and notecard to the end of the correct yes or no arrows.
- Discuss what each group used as their first question (My class used "Is it chocolate or not?")
- Have students draw two more nodes and links, starting where their last links ended. (***See second picture at the end of this document***).
- Have students write in yes and no beside the lines like before, and develop a new question to split each of the two groups as equally in half as possible.
- Have students repeat this process, adding more nodes and links until each candy is on its own at the end of an arrow.
- Have students move all of their candies above their first question, and then move to another group's decision tree.
- Have students use the other group's tree to sort the candies, moving the candies through the yes / no questions and paths. Tell students to do exactly what the question asks. Be strict! IT IS NORMAL AND OK FOR THINGS NOT TO WORK!!!!!
- Tell students to leave the candies where they end up on the tree, and then have students go back to their decision tree.
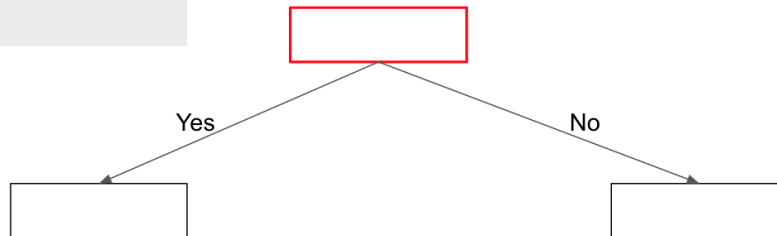
- Give students 5 minutes to make changes to their feature questions and test their updated trees.
- Move the candies to the top of the tree, and then move to a different group's decision tree than they checked before
- Repeat the process of checking the other groups tree
- Have students go back to their original tree and make any final changes
- Document the trees by taking a picture of each group's tree.

Day 2:
- Define terms
  - Features
  - Root node
  - Decision node
  - Leaf nodes
- Use the created trees (or pictures of them) to create feature vectors (See teacher slides)
- Explain usefulness in real life
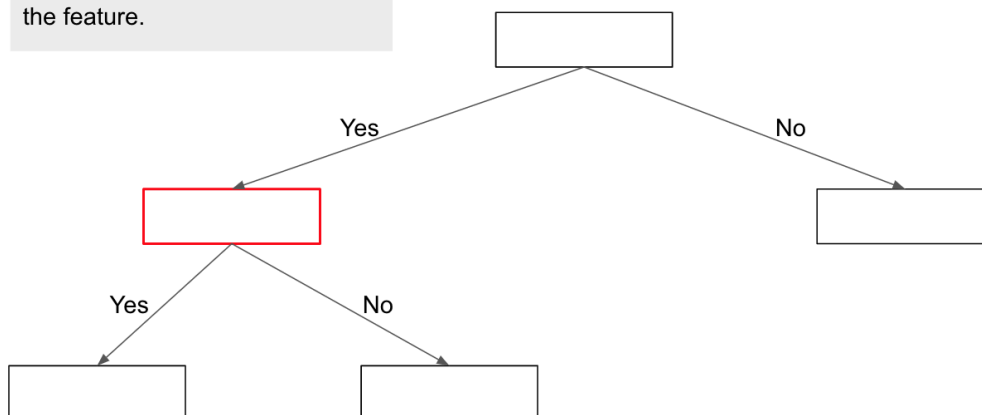
Step 4: Create two children of the current node and split its candies between them based on the feature.

Yes

No

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Step 4: Create two children of the current node and split its candies between them based on the feature.

Yes

No

Yes

No

6