How can we visually represent probability?

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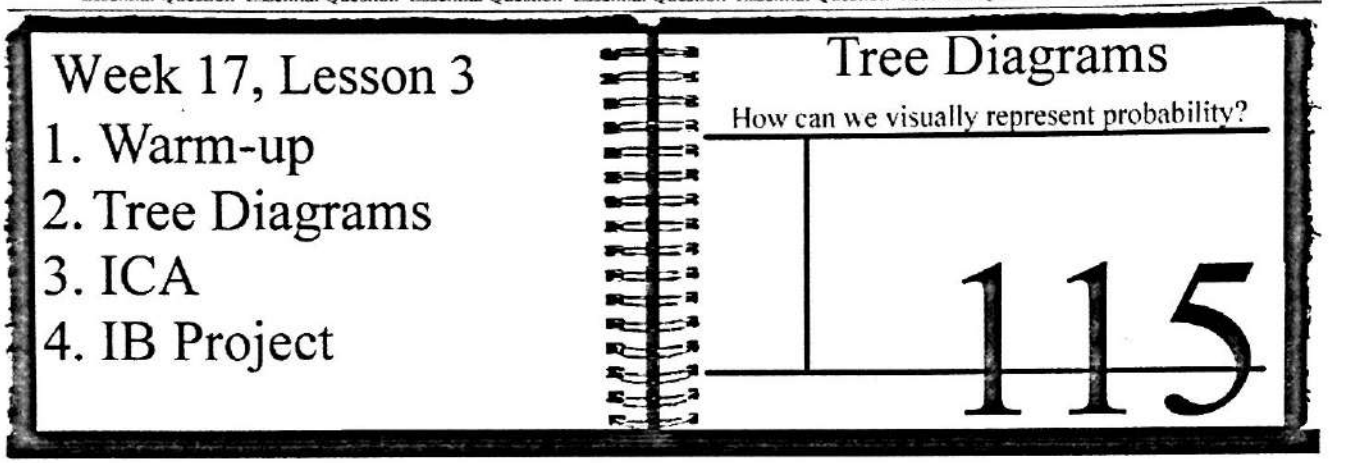


Warm-up: A survey was given to see which type of juice people prefer in the mornings.

	Apple Juice	Orange Juice	Total
Male	76	15	
Female	29	30	
Total			

Find the probability that a random survey was:

1. A male AND they picked apple juice

2. A female GIVEN they picked apple juice

3. Apple juice GIVEN that a female filled it out

* Hint * Fill out the table first.

Standard 3.7 **Tree Diagrams**

Tree Diagrams can be used as a visual representation to probability, representing *all possible outcomes*

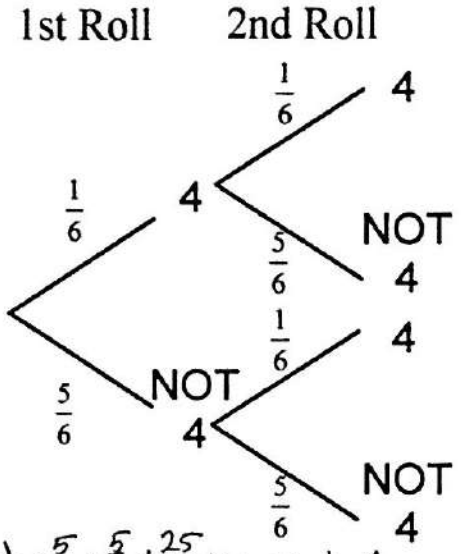
Trey is trying to roll a die twice. He is trying to roll a 4, then another 4.

$P(4 \cap 4) = \frac{1}{6} \cdot \frac{1}{6} = \frac{1}{36}$

$P(4 \cap 4') = \frac{1}{6} \cdot \frac{5}{6} = \frac{5}{36}$

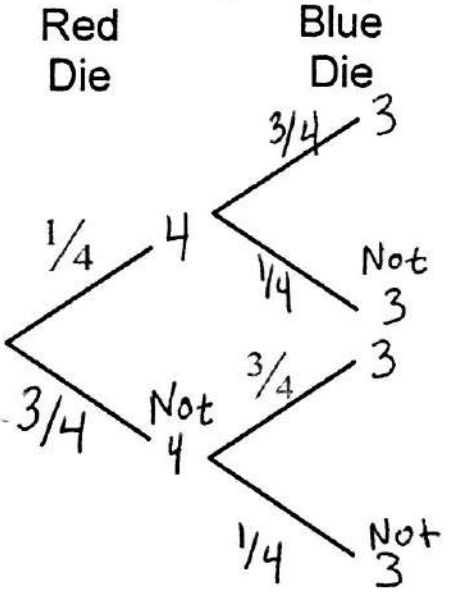
$P(4' \cap 4) = \frac{5}{6} \cdot \frac{1}{6} = \frac{5}{36}$

$P(4' \cap 4') = \frac{5}{6} \cdot \frac{5}{6} = \frac{25}{36}$



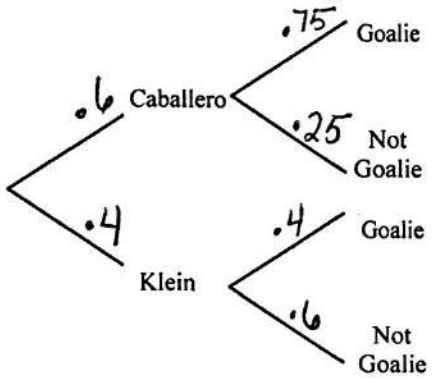
* when you add $\frac{1}{36} + \frac{5}{36} + \frac{5}{36} + \frac{25}{36}$ you get 1

Example 1- Mr. Wray decided to load two die in order to cheat his students out of money. The red die is changed so a 4 comes up ¼ of the time. The other options are equally probable. The blue die is changed so a 3 comes up ¾ of the time. The other options are equally probable. If he rolls a red 4 and blue 3, he wins. Create a tree diagram to explore all possibilities.



Conditional Tree Diagrams

You want to be goalie on your soccer team, but your chances depend on which coach you have, Caballero or Klein. There is a *.6 chance of Coach Caballero. If Caballero is coaching, then* there is a .75 chance of being goalie. If Klein is coaching, then there is a .4 chance of being goalie.



$P(C \cap G) = .6 \cdot .75 = .45$

$P(C \cap G') = .6 \cdot .25 = .15$

$P(K \cap G) = .4 \cdot .4 = .16$

$P(K \cap G') = .4 \cdot .6 = .24$

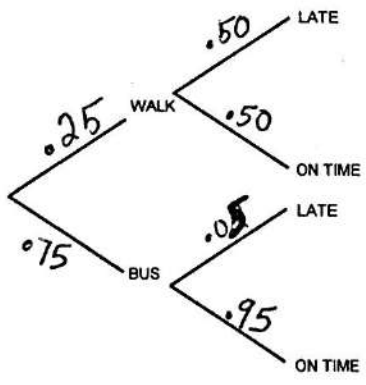
What is the probability of being goalie, regardless of the coach?

$.45 + .16 = .61$

What is the probability of not being goalie, regardless of the coach?

$.15 + .24 = .39$

Example 2- You have a .25 chance of missing the bus and walking to school. If you have to walk, then there is a .50 chance of being late. If you catch the bus, there is only a .05 chance of being late.



$P(W \cap L) = .25 \cdot .5 = 0.125$

$P(W \cap T) = .25 \cdot .5 = 0.125$

$P(B \cap L) = .75 \cdot .05 = 0.0375$

$P(B \cap T) = .75 \cdot .95 = 0.7125$

What is the probability of being late to school?

$0.125 + 0.0375 = 0.1625$

What is the probability of being on time to school?

$0.125 + 0.7125 = 0.8375$

Summary

ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity

Truth table Review

Construct the truth tables for the following. Make up your own statements for p, q, and r if needed

$p \wedge (\neg q \wedge r)$

$p \wedge \neg(\neg q \wedge \neg r)$

Closure Closure

Right Side...

Write a summary that answers the essential question.

Left Side...

Quick write:
Write down one thing you understand very well from this lesson, and one thing you do not understand very well from this lesson.
Share this with a neighbor.