

Teacher's guide

Hi. Thanks for watching this video lesson on the introduction to probability. This lesson focusses on calculating the probability of random events.

1. At the beginning of the lesson, students played the spinning wheel game in which there are four female and two male participants. The wheel was spun three times, so the sample space has seven different combinations of male and female students. It is impossible to get a combination of three males because there are only two male participants. But if we increase the number of male students, the sample space will include eight combinations, rather than seven. So the teachers should emphasize that the number and gender of participants can directly alter the sample space. Teachers could change the number of participants and male to female ratio according to the actual study body, and even spin the wheel a few more times to test the students' understanding of sample space.
2. Making the spinning wheel is quite simple. It works as long as there is a spinning pointer. The teacher could find a wood board to which the pointer is anchored. To be fair, the teacher could ask a student volunteer to spin the wheel and the wheel must turn around at least three circles. In addition, teachers could also use the hand of a watch as a pointer. For example, the teacher can stand in the middle of the circle and ask a student to call a stop after a random amount of time. Then the teacher checks the direction of the hand on the watch. So the student pointed by the hand will be selected to win a prize. The prizes for the winners could be sweets and snacks. The goal of prizes is to motivate students to participate in the game.
3. Before playing this video lesson, the teacher could spend some time showing the students how to draw tree models. Teachers could explain what the nodes, the branches and the ends represent. For example, each terminal of the tree model reflects a possible outcome. Teachers can also come up with a few real-life examples and ask the students to draw the tree models accordingly. In this video lesson, the origin of the tree generates two branches because we only care about the gender of students. One example can be a box of marbles with three different colors: red, yellow and blue. In this case, there would be three branches because we care only about the color of the marbles.
4. When students first learn about the three properties of sample space, they might find it abstract. So during group discussions, teachers could participate in the discussions to offer some real life examples to help students better grasp the concepts. For example, teachers could talk about the next day's weather condition (sunny, cloudy, rainy, snowy, storm), type of pants students might wear on a random day (jeans, suit pants, casual pants, leather pants), the types of vegetables at lunch in the school cafeteria (cucumber, carrots,

broccoli), etc. These examples are prevalent in our life. So through learning probability, students could look at their life in a completely different perspective.

5. In the last activity, students are asked to draw a probability distribution of the time spent on doing their homework, which might be challenging for beginners. In this lesson, we used a histogram to demonstrate the problem. The teachers might try to explain what a histogram is and what the coordinates represent. In addition, teachers could introduce other types of graphs such as pie charts. The students could then choose the most straight-forward way to demonstrate probability problems.
6. Teachers could also encourage students to play the spinning wheel game during their spare time. They might spin the wheel many times, take note of the results, and use the law of large numbers to approximate the true probability. For example, when four females and two males stand in a circle, if the wheel is spun 100 times, then either one of the males will be picked around 33 times. Likewise, if students want to find out the probability of picking two boys when the wheel is spun three times, then they should take note of the results after the wheel is spun 3 times consecutively, repeat this process until they obtain 100 results. In other words, the wheel will be spun 300 times to get 100 results. According to the law of large number, there should be 20 results including two boys being picked. Thus, through experiment, students can deepen their understanding of probability problems.

Again, thank you for using this video lesson, if you have any questions regarding this lesson, please feel free to contact me through email. Have a nice day!