Home Learning Activities: Week 6

Grade 7M – Mr. Methot

Last week our focus was on understanding and identifying the **sample space (l'espace échantillonnal) of a **probability experiment (expérience de probabilité)** involving 2 **independent events (évènements indépendants)**. The sample space of a probability experiment is the set of all possible outcomes for that experiment. We can represent and organize the sample space for any experiment in a **tree diagram (diagramme en arbre)** or a **table (tableau)**. I have shown some examples of this in last week's file: "**L'espace Échantillonnal**".

**A little trick to quickly figure out the total number of possible outcomes in a probability experiment is to multiply the number of possible outcomes of one event (ex. flipping a coin) by the number of possible outcomes of a second event (ex. rolling a dice). There are 2 possible outcomes when flipping a coin and 6 possible outcomes when rolling a dice, so therefore there are 12 (2x6=12) total possible outcomes in the sample space of this experiment.

This week we will be exploring and comparing **theoretical probability (probabilité théorique) and **experimental probability (probabilité expérimentale)** of a probability experiment involving 2 independent events. Let's use last week's example of flipping 2 coins. Once we have identified and organized the sample space **{(h,h) (h,t) (t,h) (t,t)}**, we can use it to determine the theoretical probability of each outcome. What is the theoretical probability of tossing tails on both coins (t,t)? Since this is one of the possible outcomes, and there are 4 total possible outcomes, the theoretical probability is 1/4. What is the theoretical probability of tossing one head and one tail in any order (h,t) or (t,h)? Since these are 2 of the 4 possible outcomes, the theoretical probability is 2/4 = 1/2. Next, we can conduct an experiment of flipping 2 coins to compare the experimental probabilities to our theoretical probabilities. Let's say for our experiment we decide to flip the coins for 100 **trials (essais)**. We can use a table to record a tally mark of the outcome for each trial of the experiment, and after 100 trials, we can use our tally marks to find the experimental probability of each outcome. Check the file named "**Mener une Expérience avec 2 Évènements Indépendants**" where I have performed the

probability experiment of flipping 2 coins and compared the theoretical and experimental probabilities.

**Here are some links to videos in French that can help you with understanding probability for this week's learning activities:

https://www.youtube.com/watch?v=6EE_J2Wzmkw&list=PLrt_BPqnOBnNEP6o-RrYTW60Hwd_YKA4_&index=6 (Les Diagrammes en Arbre)

https://www.youtube.com/watch?v=rWoOeFI8lHg (Le Diagramme en Arbre)

https://www.youtube.com/watch?v=bhB9JhRJUyk&list=PLrt_BPqnOBnNEP6o-RrYTW60Hwd_YKA4_&index=9 (La Probabilité avec un Tableau)

Monday

- **Brainpop:** There are lots of great educational videos and quizzes you can try on www.fr.brainpop.com. Feel free to explore the website as much as you want. You can use my account to gain access. Click on "se connecter" to log in. The username is Mr.Methot and the password is Raiders2020. Check out the subject "Sciences de la Terre" at the top of the homepage. Then on the next page click on "Sujets". Find the topic called "Tectonique des plaques". There is a video you can watch and quiz questions you can try.

- **Netmath questions:** Continue with the activities/lessons on www.netmath.ca. Here are the lessons you can focus on this week. If you complete all of these, you can always revisit incomplete lessons from past weeks.

    1. **Utiliser un arbre de probabilités…**
    2. **Déterminer les résultats possibles 5**
    3. **Calculer des probabilités dans diverses situations 1**
    4. **Déterminer la probabilité d'un évènement 1**

    Bonus 1: Les défis de Sonya – Sonya et ses amis

    Bonus 2: Les défis de Sonya – Halloween

Tuesday

- **Puzzles + games:** You can always go back and revisit puzzles and card games from previous weeks that you enjoyed or want to complete.

    1. **Breakout EDU game:** This week you can attempt to solve another online puzzle that requires you to use the clues to unlock a series of digital locks. It is lots of fun! The game focuses on the theme of probability.

       To access the game, you will need to create a student account and join the class I've created. You will find the instructions to create your account in the file titled "**Breakout EDU Account Instructions**". Here is the class code: RY71AF. When you need to create a password, my suggestion is to use the same password that you use for Office 365. Once your account is created, you should see that you have joined Classe 7M. Click on the class, and you will see the game that I have assigned for you to play called "Superhero Game". If you haven't played last week's game, you still can play that one too called "Cat Kid the Super Hero". For those of you that have already created your class account, use this link to log in: http://student.breakoutedu.com/login

       If you need some help solving the puzzles, I can provide you with some hints and explanations. I also have access to the combinations for each lock if you are stuck. Once you are finished the game, here are a couple of reflection questions that you can think about:

       a) What is the probability that the superhero will not make the jump over the black hole? How do you know?
       b) How did you determine the sample space from the spinner?

    2. **Yahtzee:** You can play this one again, or maybe you didn't get a chance to last week. For this game you will need at least one other player and 5 dice. If you want to play but don't have the dice, you can make them out of paper! Here is a website that explains the rules and scoring process of the game, and also provides score sheets that can be

downloaded and printed: http://templatelab.com/yahtzee-score-sheets/. There are also videos on YouTube that explain how to play.

You may not realize it, but this dice game allows you to use your probability skills when deciding which dice to roll a second and third time. Good luck!

3. **Rock, paper, scissors**: A classic game that we've all played before! Let's think about the probability involved in this game, since after all, it is a game of chance! Assuming both players randomly choose between rock, paper, or scissors, the theoretical probability of winning is 1/3 for both players. The probability is also 1/3 for losing and 1/3 for tying. If you and a partner are playing what is the probability that…

   - **Your partner chooses rock?**
   - **Your partner chooses something other than scissors?**
   - **You and your partner will choose the same thing? Think about the sample space and all the possible outcomes…**
   - **You and your partner will both choose paper?**

   Now with a partner, actually play rock, paper, scissors. You could play for 10, 20, or even 50 rounds if you want. Keep track of which thing your partner chooses each round, which thing you choose each round, who wins each round, and which rounds were ties. Then at the end you can explore the experimental probability that…

   - **Your partner chose rock… or paper… or scissors…**
   - **You chose rock… or paper… or scissors…**
   - **Your partner won…**
   - **You won…**
   - **You and your partnered chose the same thing and tied…**

   How do your experimental probabilities compare to your earlier theoretical probabilities from before you started playing?

Wednesday

- **STEAM challenge:** Your challenge this week is all about water! You will need to explore and venture outside for a local water source like a river or a stream to collect natural water. With the water you collect, you will build a water filtration system to turn dirty or salty water into clean water. Be sure not to drink the water though! There is some information and tips to help you included in the attached file named "**Défi de STEAM semaine 6**". I have included the English version of the document as well with the name "**STEAM challenge week 6**". Be sure to use the third page for grades 6-8. I'd love to see your water filtration systems and some pictures to compare the water before and after being filtered, so feel free to share on Teams with the class!

- **Numeracy activity:** We've already discussed how we use so much more water each day as humans than we realize. In this activity you will examine the water bill of a family of 4 people and figure out which household appliance is costing the family the most money based on water usage. This question is included in the same files as above. Are you surprised by any of the percents in the pie chart?

Thursday

- **Netmath questions:** Continue with wherever you left off. If you happened to have completed all the activities/lessons that I've given you so far, then you can explore the website and find a new topic that interests you to try. Click on "Livres" on the left-hand side of the screen to find all the different math topics.

Friday

- **Probability experiment with 2 independent events:** With this activity you are going to apply all the concepts you have learned about probability and put them all together! I would like you to conduct a probability experiment involving flipping a coin and rolling a 6-sided dice.

First, begin by considering all the possible outcomes of this experiment (sample space). Represent the sample space in both a tree diagram and a table. Then with your sample space, find the theoretical probability of each possible outcome. You can also think about the probabilities of different combinations of outcomes, such as the theoretical probability of tossing a tail and rolling an odd number, or tossing a head and rolling a number bigger than 2. To find these probabilities you would need to add fractions together.

Now you are ready to perform the experiment. Let's do 100 trials of flipping the coin and rolling the dice. Be sure to mark the outcome of each trial in a table. Once you have completed 100 trials, you can use your table to find the experimental probability of each possible outcome. Compare the experimental probabilities you just found to the theoretical probabilities of each outcome. Which experimental probabilities are bigger? Which are smaller? Are there any that are the same? I would love to hear about your experiment and see your results, so you are welcome to share on Teams!

If you enjoyed this and want to repeat the activity with a different experiment, you could try rolling 2 dice, or even choosing a card from a deck of cards and flipping a coin (this one will have a very large sample space!).

Extras

- **Research question of the week:** **When was the most recent earthquake in Canada, and where did it occur? When was the most recent volcanic eruption in Canada, and where did it occur?** You can share your answers with the class on Teams!

- **Math problem of the week:** Each week I will give you a challenging math problem to try created by the University of Waterloo, good luck! https://cemc.uwaterloo.ca/resources/potw/2019-20/French/POTWC-19-NN-PA-30-P-f.pdf

Here is the solution to last week's problem:
https://cemc.uwaterloo.ca/resources/potw/2019-20/French/POTWB-19-DP-27-S.pdf

- **Brainpop:** You can check out a video that talks about the coronavirus and test your knowledge with the quiz! "Nouveau & Tendance" → "Coronavirus".

- **Probability simulator:** Here is an online spinner you can check out that simulates a probability experiment and compares theoretical and experimental probability. You can play around with it by adjusting the number of spins/trials and the number of sectors on the spinner.
https://www.nctm.org/adjustablespinner/

- **Probability games:** If you didn't have a chance yet, you can check out the website link to games that I posted on my teacher page last week.

Talk to you all Thursday @ 2pm!

Sports Kahoot Game!

https://twitter.com/gerritbosma9