



# FEATURING ROCKET LEAGUE®

## SCORING WITH STATS A ROCKET LEAGUE MATH CHALLENGE

### LESSON PLAN

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### ABOUT THE AUTHOR

Daniel Rolo is a junior/intermediate teacher with the St. Clair Catholic District School Board specializing in the integration and implementation of S.T.E.A.M. technologies and concepts, particularly with integrating interactive 3D technologies using the Unreal Engine and Twinmotion. Daniel is a founding member of the Ontario School Esports Associations (est. 2021), a not-for-profit organization that supports Ontario schools in implementing robust scholastic esports programs by creating high-quality, student-centred learning experiences through esports and gaming, and by providing curriculum, competition, and community for all students to use esports as a platform to grow as individuals.

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### LESSON OBJECTIVE

Students will demonstrate an understanding of data collection, data measurement, and probability.

### ACTIVITY SUMMARY

Students will analyze game data and statistics in Rocket League to draw conclusions and make predictions about game play.

## CURRICULUM EXPECTATIONS

### Data Management and Probability:

- Collect and organize categorical or discrete data to answer questions.
- Read, describe, and interpret primary data and secondary data presented in charts, tables, and graphs.
- Make and evaluate predictions based on data presented in charts and graphs.
- Understand basic probability concepts and represent probabilities using fractions, decimals, and percents.

### Number Sense and Numeration:

- Represent, compare, and order whole numbers, fractions, decimals, and percents.
- Solve problems involving the addition, subtraction, multiplication, and division of whole numbers and decimals.

## REQUIREMENTS

The following materials are needed for this activity:

- Access to the game Rocket League® (or video of a Rocket League match)
- Understanding of how to create a private match (see appendix A)
- Graph paper or digital graphing tools
- Calculators
- Pencils, markers, erasers

## TIMELINE OVERVIEW

This lesson is best completed in two 50 minute periods.

| Period | Activity                       | Recommended Time |
|--------|--------------------------------|------------------|
| 1      | Introduction                   | 10 min           |
|        | Playing Rocket League          | 20 min           |
|        | Data Analysis                  | 20 min           |
| 2      | Probability Calculations       | 20 min           |
|        | Scenario-Based Problem Solving | 15 min           |
|        | Reflection and Application     | 15 min           |

**INTRODUCTION (10 MIN)**

- Start by discussing the importance of data collection and probability in everyday decision-making and how these concepts can also be applied in games like Rocket League.
- Briefly introduce the key math concepts that will be covered: data collection, analysis, and probability.

*OPTIONAL: If students are not familiar with the game Rocket League, introduce the game by watching some Rocket League gameplay videos.*

**PLAYING ROCKET LEAGUE (20 MIN)****Set Up:**

Organize students into small groups or pairs, depending on the number of available gaming setups. Each group will play several rounds of Rocket League in a controlled setting, with a focus on gameplay elements like scoring goals, making saves, and taking shots.

**Task:**

While playing, students will collect data on the following:

- Number of goals scored by each team.
- Number of shots on goal taken.
- Number of saves made by each team.
- Number of times the ball hits the walls.
- Time taken to score each goal.

**Recording Data:**

Students will record their data in a table, noting down the occurrences of each event for each match they play.

**DATA ANALYSIS (20 MIN)**

After the gameplay session, students will organize their collected data into charts or graphs (e.g., bar graphs to compare the number of goals scored by each team, pie charts to show the percentage of shots on goal that resulted in scores).

Guide students in analyzing their data to answer specific questions:

- What is the average number of goals scored per match?
- What percentage of shots on goal result in a score?
- How many saves does each team make on average per match?

**PROBABILITY CALCULATIONS (20 MIN)**

Use the data collected to calculate the probabilities of different events. For example:

- What is the probability of scoring a goal based on the number of shots taken?
- What is the probability of a team winning if they score the first goal?

Have students represent these probabilities as fractions, decimals, and percents.

Discuss how understanding these probabilities could influence their strategy during the game.

**PROBLEM SOLVING (15 MIN)**

Present students with scenario-based problems that require them to use their data and probability knowledge. For example:

- If a player scores 8 goals out of 20 shots, what fraction of their shots result in a goal, and what is the percentage?
- If a team scores the first goal in 4 out of 6 matches, what is the probability they will win those matches?

Have students work in pairs or small groups to solve these problems, using the data they collected.

**REFLECTION AND APPLICATION (15 MIN)**

Discuss how the analysis of data and understanding of probability can help make better decisions not only in Rocket League but also in real-world situations, such as sports or other strategic games.

Have students reflect on what they learned about data management and probability, and how they can apply these concepts to future games or activities.

**ASSESSMENT**

Use the provided rubric (see Appendix B) to assess student learning.

# APPENDIX B | RUBRIC

|                            | Level 1   | Level 2  | Level 3   | Level 4   |
|----------------------------|---|--|---|---|
| Data Collection            | <ul style="list-style-type: none"> <li>- Minimal data collected.</li> <li>- Data is incomplete or inaccurate.</li> </ul>                        | <ul style="list-style-type: none"> <li>- Some relevant data collected but lacks detail.</li> <li>- Data may have minor inaccuracies or gaps.</li> </ul>    | <ul style="list-style-type: none"> <li>- Sufficient data collected, relevant to the activity.</li> <li>- Data is mostly accurate and complete.</li> </ul>     | <ul style="list-style-type: none"> <li>- Extensive data collected, with attention to detail.</li> <li>- Data is accurate, complete, and well-organized.</li> </ul>  |
| Data Organization          | <ul style="list-style-type: none"> <li>- Data is poorly organized.</li> <li>- Limited or unclear representation.</li> </ul>                     | <ul style="list-style-type: none"> <li>- Data is somewhat organized but lacks clarity.</li> <li>- Basic charts or graphs used with some errors.</li> </ul> | <ul style="list-style-type: none"> <li>- Data is well-organized.</li> <li>- Charts and graphs are clear and accurate.</li> </ul>                              | <ul style="list-style-type: none"> <li>- Data is exceptionally well-organized.</li> <li>- Charts and graphs are clear, accurate, and creatively presented.</li> </ul>   |
| Data Analysis              | <ul style="list-style-type: none"> <li>- Minimal analysis with little connection to the data.</li> </ul>  | <ul style="list-style-type: none"> <li>- Basic analysis with some understanding of trends.</li> </ul>  | <ul style="list-style-type: none"> <li>- Analysis is thoughtful and connected to data trends.</li> </ul>  | <ul style="list-style-type: none"> <li>- In-depth analysis with strong connections to data trends and insights.</li> </ul>  |
| Probability Calculations   | <ul style="list-style-type: none"> <li>- Limited understanding of probability.</li> <li>- Errors in calculations or representations.</li> </ul> | <ul style="list-style-type: none"> <li>- Basic understanding of probability with some errors in calculations or representations.</li> </ul>                | <ul style="list-style-type: none"> <li>- Proficient understanding of probability.</li> <li>- Calculations and representations are mostly accurate.</li> </ul> | <ul style="list-style-type: none"> <li>- Advanced understanding of probability.</li> <li>- Calculations are accurate, with clear and correct representations in fractions, decimals, and percents.</li> </ul> |
| Problem Solving            | <ul style="list-style-type: none"> <li>- Limited ability to apply data and probability to solve problems.</li> </ul>                            | <ul style="list-style-type: none"> <li>- Basic problem-solving with some connection to data and probability.</li> </ul>                                    | <ul style="list-style-type: none"> <li>- Effective problem-solving using data and probability.</li> <li>- Solutions are logical and well-reasoned.</li> </ul> | <ul style="list-style-type: none"> <li>- Exceptional problem-solving, creatively applying data and probability.</li> <li>- Solutions are insightful and well-explained.</li> </ul>                            |
| Reflection and Application | <ul style="list-style-type: none"> <li>- Limited reflection with little connection to learning.</li> </ul>                                      | <ul style="list-style-type: none"> <li>- Basic reflection with some connection to the lesson objectives.</li> </ul>  | <ul style="list-style-type: none"> <li>- Thoughtful reflection, connecting the activity to math concepts.</li> </ul>  | <ul style="list-style-type: none"> <li>- Insightful reflection with strong connections to real-world applications and math concepts.</li> </ul>   |

**Comments:**