

Probability: Everyday Decisions Based on ProbabilitiesII.B Student Activity Sheet 5: Probability in Games

Victoria is playing a new video game in which the object is to find hidden treasures. To do so, she must travel through several levels, clashing with guards and watchdogs. In one part of the journey, Victoria must pass through two gates (Gate 1, then Gate 2) to get to the next level.

- The chance that Gate 1 is open is 20%.
- The chance that Gate 2 is open is 30%.
- The game designer has programmed the gates so that the probability of both being open at the same time is 0.1.

Draw a model of the situation to help you answer Questions 1-5. Explain why you chose the particular type of model from among the various probability models.

1. What is the probability that both gates are open when Victoria reaches this part of the game? Explain your reasoning.
2. What is the probability that only Gate 1 is open when Victoria reaches this part of the game? Explain your reasoning.
3. What is the probability that only Gate 2 is open when Victoria reaches this part of the game? Explain your reasoning.
4. What is the probability that neither gate is open when Victoria reaches this part of the game? Explain your reasoning.
5. What is the probability that Victoria finds exactly one gate open?

Victoria encounters another challenge in the game. If she zaps a target in one try, Victoria gets a chance to capture a bonus shield. To capture the bonus shield, she must hit a second target in one try. Victoria can hit a target in one try an average of 60% of the time.

Draw a model of the situations to help you answer Questions 6-8.

6. What is the probability that Victoria hits the first target? Explain your reasoning.
7. What is the probability that Victoria captures the bonus shield? Explain your reasoning.
8. What is the probability that Victoria hits the first target and does not hit the second target to capture the shield? Explain your reasoning.

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9. **REFLECTION:** How would you advise your friends who might be interested in playing a new video game?

10. **EXTENSION:** Create two probability situations that use conditional probability. Describe the outcomes for these situations.

11. **EXTENSION:** Create a probability situation that uses compound events. Describe the outcomes for the situation. What type of model do you think will help you answer questions about the situation?