Q1

Good design choice (gameplay): The game's resource management system is really engaging — having to balance food, health, and supplies keeps the player actively thinking about every decision. It makes the journey feel more realistic and challenging.

Good design choice (education): The game seems pretty historically accurate and educational since it sets the stage pretty well and gives players a sense of what traveling the Oregon Trail was actually like.

Questionable (gameplay): Some events feel a bit random or unfair, like when a character suddenly dies from an illness without much warning. It can be frustrating since there's not always a clear way to prevent it.

Questionable (education): Even though the game gives a good overview of life on the trail, it mostly focuses on the settler perspective and doesn't really cover the experiences of Native Americans or other groups who were affected by westward expansion.

Q2 Math Learning Goals

- Students will be able to add and subtract fractions with like and unlike denominators and represent them visually.
- Students will be able to identify factors and multiples of whole numbers under 100 and distinguish prime from composite numbers.

Q3 The Learner
Age: 4th grade
Prerequisites

- Basic understanding of addition, subtraction, multiplication, and division
- https://www.beaverton.k12.or.us/departments/teaching-learning/curriculum-instruction-assessment/learning-targets/mathematics/4th-grade-math

Q4 Game Vision
Our game, Math Explorers: Galactic Quest, takes players on a space adventure where they journey through the planets of our solar system by solving math challenges.

Each planet represents a level that players (aliens) have to get through to make it all the way to their home planet (Pluto).

Along the way, they encounter mini-games, with an example of that being a "Rapid Fire" sequence of quick 4th-grade math questions. The experience will combine the excitement of outer space exploration with engaging math practice in order to motivate learners to advance through the galaxy while strengthening their core math knowledge.

Q5 Mini Games

1. Rapid-fire math questions
2. Fuel Fractions
    a. Story context:
        i. Your spaceship's fuel tanks are divided into fractional sections. To survive the trip, you need to combine and allocate fractions of fuel correctly to power the engines.
    b. Gameplay mechanics:
        i. The player sees several fuel tanks labeled with fractions (e.g., 1/2, 1/4, 3/4).
        ii. The ship's computer says: "You need exactly 1 whole unit of fuel to jump to the next planet."
        iii. The player must drag and drop the correct fractions into the fuel line to make 1 whole (or another target number, like 1 1/2).
        iv. Later levels: adding unlike denominators (e.g., 1/3 + 1/6), visualized as bar models or pie charts.
    c. Learning Goal:
        i. Students will be able to add and subtract fractions with like and unlike denominators and represent them visually.
3. Asteroid Factor Field
    a. Story context:
        i. The ship is flying through an asteroid belt. The asteroids have numbers written on them. You can only blast the asteroids that are factors or multiples of the ship's "safety code."
    b. Gameplay mechanics:
        i. A number (e.g., 24) appears as the safety code.
        ii. Asteroids fly across the screen with numbers on them (e.g., 3, 8, 12, 25, 48).
        iii. The player must click/blast the ones that are either factors or multiples of 24.
        iv. Wrong blasts cause ship damage; missing correct ones costs points.
        v. Higher levels: introduce prime/composite recognition.
    c. Learning Goal:
        i. Students will be able to identify factors and multiples of whole numbers under 100 and distinguish prime from composite numbers.