Math Blaster

1. What is being learned? What are the underlying assumptions (explicit and implicit) about the nature of knowledge?

The game is designed to have students practice their math skills. All the basic skills are available for the student to practice, addition to division. The students are expected to be learning their basic skills. The game is assuming that knowledge is gained by practice and repetition. Practice and repetition activities suggest that knowledge is explicit. The game is expecting that the student needs to test the implicit knowledge of basic math practicing. The game suggests that two tries is enough before the answer should be revealed, which implies to the student that finding the right answer is much more important than knowing what that answer represents. The software includes three skill-building games and the “Math Blaster” game. The skill-building games are focused on the practice of the knowledge. These games allow the student to try twice and then reveal the answer, but don’t give points for incorrect answers. The result of this approach, is that the games do nothing to support exploration and learning from mistakes, it keeps the focus on extrinsic motivation. The “Math Blaster” piece is basically the assessment piece, it presumes that the student has the knowledge and will apply it. It also implies that the skills practiced in the other parts of the software can be transferred to the different format (you control your character and have to figure out how to make the character reach a “portal” that holds the correct answer to the different problems.)

2. How does learning take place? What are the underlying assumptions (explicit or implicit) about the nature of learning?

Learning is expected to take place as the students cycle through repetitive drills. One explicit assumption made by the game’s designer is that the
student will choose the answer that completes the problem correctly and the learning about math will take place above and around the “game navigation” skills. The game does not do any explaining or teaching. It implies that math is simply right or wrong and to learn math one must simply go through problem after problem placing a “correct” answer on a line to “prove” it has been learned. I suppose a teacher could use the navigation aspect of the game to open discussion about critical thinking skills. Many people would not even notice/think about the navigation piece, but if discussed a person could use it to start the process of increasing students/peoples awareness of their learning.

3. What role does technology play? What advantages or disadvantages does the technology hold for this role? What unique contribution does the technology in facilitating learning?

Technology plays the role of the delivery system. It delivers the student and opportunity to practice and apply their knowledge of their basic math facts. The advantage is that the students who already understand the information have an interesting set of “flashcards” to use for practice. The disadvantage is that the game does very little to explain or help the person who has any misunderstandings or misconceptions about these basic math skills. The unique contribution is that if a student is truly analyzing the game, they practice more than the times tables. The game does offer some motor skill and analytical challenges, as you have to figure out how to navigate the different levels and boards.

4. How does it fit within existing school curriculum? (e.g., is it intended to supplement or supplant existing curriculum? Is it intended to enhance the learning of something already central to the curriculum or some new set of understandings or competencies?)

The game fits into existing curriculum. It fills the role of any drill-based activity that is already used. Flash cards do the same thing that this game does; they reinforce the idea that repetition and memorization are the keys to mathematical success. It attempts to engage students by putting them in
front of a computer and giving them a character to maneuver, but it is little more than glorified flashcards or drill worksheets. This is not to say that there is no place for memorization in education, but I think we should invest as much time into comprehension and application of information as possible. Memorization is a limited (and limiting) tool that is great for some tasks, but being able to understand a problem and apply the correct tools should be our ultimate goal.

5. How does the technology fit or interact with the social context of learning? (e.g., Are computers used by individuals or groups? Does the technology/activity support collaboration or individual work? What sorts of interaction does the technology facilitate or hinder?)

The software could be used as group tool, but it does not require input from multiple players or allow for easy interaction between multiple group members. It is designed as a person practice device. It would hinder interaction because the actual “Blaster” game is timed and so groups trying to play that part would have to come up with the correct answer, choose a correct answer from the ideas the group was presenting, then navigate the character in the game to the correct spot in the game. It does not facilitate the discussion of those answers or peer-to-peer teaching; it simply facilitates making choices under pressure.

6. How are important differences among learners taken into account?

The differences between learners are not addressed by this game. The argument that problems are delivered at the individual learner’s “level” is false. For that argument to be true each student would need to have an individual identity in the game. Every achievement, and failure, would need to be tracked, so that instruction was actually individualized based on what the student needed to practice. This game is not about learning. The game simply asks students to fill in blanks, practice placing facts you have learned. If you are not interested in manipulating a little character around the screen and trying to beat the time limits, this game has little to offer you. All the games operate on similar principles and the variety is only visual. It simply is not catering to various learning styles.
7. What do teachers and learners need to know? What demands are placed on teachers and other "users"? What knowledge is needed? What knowledge supports does the innovation provide? (e.g., skills in using particular kinds of technology)

Learners and teachers need to understand how to navigate the different games and their basic math facts. The game demands that the user can provide the answers to basic math questions quickly and that the user can operate the interface well enough to put choose those answers in the correct place for the game to recognize them. The user is able to practice using the mouse and keyboard as input devices.