

Voyage through the Solar System: Formative Testing of App Activities

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December, 2022

Background

In December 2022, formative beta testing of three app activities was conducted at SMM. The activities are part of the new addition to the DIY app series. The target audience for these activities is kids ages 8-12. Participants were observed using the activities, then completed a brief group survey about their experience. Three activities were tested.

- AR Space Walk: Explore the our solar system through a smartphone using AR
- Mars Rover: Program a rover by coding instructions so the rover can complete its mission
- Build a spacesuit: Create a custom-fitted spacesuit using AR measurement

Sample

Eval staff recruited groups on the floor at SMM over the course of 4 days in December, and asked each group to test out 2 of the activities. Overall, 15 groups participated. Each group completed 2 activities, and one group completed all 3.

Activity	# of cases
Build a spacesuit	9
Mars Rover	11
Planet walk (free placement mode)	11

- Average group size: 3.7
- Average time spent on the activities: 14 minutes
- All groups completed two activities, except for one group which did all three activities
- Groups most frequently had two adults (8 groups)
- The majority of groups had no kids under the age of 8 (9 groups).
- Groups most frequently had 1 child between the ages of 9 - 14. There were 5 groups with two kids ages 9 - 14.
- Only one group had kids 15 or older.

Findings

Overall

- Overall, groups enjoyed doing the activities. Across all activities, we saw teamwork and collaboration
- In general, people enjoyed programming the rover and watching the mission video as a group
- A few groups shared that the activities felt educational

- The biggest technical issues were around using the AR for space suit measurement, and figuring out what was the starting location for the rover
- For the most part, groups knew what to do. There were challenges, specifically with the Space Suit (needing to stand against a wall, figuring out how to get the AR measuring to work) as well as some predicted difficulty in understanding what “free placement” meant in the Space Walk activity.

Activity specifics

1. Space Suit

- The majority (8 out of 9) groups read the instructions prior to doing the Space Suit activity
- Around 80% of groups experienced some sort of technical difficulties with the activity, either getting the crosshairs to appear, getting the measurement to function correctly, or something else (7 out of 9 groups)
- About 45% of groups were interested in redoing the Space Suit try-on with another group member, but ultimately decided to just retake the photo as they didn't see a clear way to restart the activity.
- While this activity was more challenging due to the technical aspects, it did appear to be enjoyable and engaging for groups. See observer notes below.

“Did the space suit activity appear to be as engaging and interesting as the other activities?”

Feedback from evaluation staff

- “Of the groups I saw, I would describe them as interested in the Space Suit activity, but having some struggles getting it to work for measurements (not knowing to have the subject against the wall would work best). That was something the adults from the groups brought up.
- Most participants enjoyed the app and had fun with the process so would agree that the Space Suit activity was in general fun and engaging like the other two activities. In fact, the follow up question about cool ways they'd use the app at home/school/with friends generated some fun ideas, like measuring your pet for a suit (that'd be really cool if it could adjust to do so), or purposely making your friends measurements longer (or shorter) to give them really long arms in the suit.
- That being said, there were a couple of wall hitting moments with more than one group that did not allow them to fully enjoy the activity together, mainly, not being able to hand the device to the next participant to fully experience the activity without exiting the activity and starting over from the home screen. One could choose to take a new picture, but there was not an option to measure a new person for a suit. More than one group (both adults and children) upon switching "drivers" found they could only choose to take another picture and ended up having the other person do only that, thus using the same suit that was generated for the first person and adding the new person's photo to it. So, the second person to try got a very minimal experience.

Despite this, there was generally laughter at seeing the second person's face in the suit. Others did exit the activity to be able to do it again or for a second user to experience the full process of measuring then picture taking; but several did not and the need for an option to select "measure a new person/suit" was a specific suggestion from one or two adults.

- All in all, groups enjoyed doing the activity even with the glitches. They enjoyed getting the picture just right as they'd take more than one when the first picture or two did not place the person's face just right. Or they'd do something more as in one instance go up close where it was just the eyeball and then call that person an alien."
- Additionally, challenges getting the AR to work also impacted experience (which we already knew).

2. Mars Rover

- Generally the most engaging, we saw a lot of groups gather around to watch the video of the rover traveling
- Nearly all (8 out of 11) groups tried the activity more than once, and 8 out of 11 groups also did not succeed at reaching the end point on one or more tries.
- Just under half of all groups couldn't figure out which was the Rover and which was the end point the first time around (5 out of 11)
- It appeared that most participants were reading the instructions, and adults were often supporting young people in reading the instructions. For most groups, we saw adults and kids working together, particularly on the first attempt.
- In the interview, all 10 out of the 11 groups who did the Rover activity shared that they enjoyed it.

3. Planet Walk

- Around three quarters of groups read directions, either out loud as a group or as an individual (8 out of 11, 72%)
- The majority of groups (90%) placed and explored more than one planet while using the activity
- Nearly every group (10 out of 11), moved around in the physical space to explore the planets.
- Overall, groups typically engaged with the planet walk together, with multiple people looking through the screen
- A few groups mentioned that it would be good to clarify how much space is needed. They started in a smaller space and it didn't work great.