



Antarctica Exhibition
Formative Evaluation of Computer Games
Skidoo
Natural History Museum, London

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1.0 Introduction

This document provides a short report on the formative evaluation of one computer activity, skidoo, for the temporary exhibition on Antarctica (2007)

1.1 The aims of the evaluation are to assess the effectiveness of achieving exhibit aims but also to assess the logistics of using the computer game.

The exhibit aims are that visitors will:

- have fun playing the skidoo game
- know there are meteorites in Antarctica
- be surprised by the unfamiliar Antarctic landscape

Key messages are:

1. Antarctica is an ideal location to find meteorites
2. researchers use skidoos to look for meteorites in the Antarctica.
3. research in Antarctica involves exploration and navigation.
4. riding a skidoo is fun!

2.0 Methodology

Family and school groups were asked to pilot the computer game skidoo on the 4th and 7th March respectively.

Participants were given a limited brief introducing the exhibition and the testing process but not the activity itself.

They were asked about meteorites before they started to see what they learnt but otherwise were given no instruction. Many were not familiar with the word skidoo and used snowmobile or sled to describe it.

The interview questions are listed below in the results table and further details can be found in the appendix.

Family interviews were of 8 boys and 9 girls aged between 5 and 14, and average 9.

3.0 Results

3.1 From families

Question	Summary of response (and quotes)
Did you have fun? Marks out of 10	All the children enjoyed it. 'Very good' 'Really fun' Marks out of 10 averaged at 9.1 'Magic'
Why was it fun?	'I liked going fast' 'Feels as though you are going fast – I like it when it bounces' 'Like real life' 'Go up hills and turn and miss them' 'Liked getting points' 'Liked smashing into things' (boy)
What was the activity about? – Confirm or otherwise learning about meteorites	Before the activity some children (about half of family groups) knew what meteorites were – 'they come from out of space' or 'stones' but many did not mention anything. They did not mention the different types but were frequently able to afterwards. Older children were more likely to have previous knowledge.

	<p>'Collecting meteorite from different places' One girl didn't think she had learnt much but she was able to describe the different types afterwards. 'Different ones to collect' 'Try to collect meteorites and points' 'Information to bring back to base' 'Oh no I missed 100 point one' 'you had to collect meteorites' 'Yes – Martian, moon and space ones' (aged 11) 'Find stones' (aged6)</p>
<p>How did you work out what to do? Did you read the text?</p>	<p>Most older children could read the text but others had problems with the speed and order of the information. However children familiar with computer games were able to learn as they went along or copy someone else. 'Just like your quad bike' (mother) 'Worked out what to do – no problem' 'I read the text' 'Understood the instructions but a bit too fast to read about the meteorites' 'Got better at it as I went along' 'Steering responsive' 'I didn't read the text – I just got going' (aged 10) 'Dad told me what to do' (aged 6) 'I didn't really read the instructions' (aged 9) 'I watched'</p>
<p>Were there any problems or anything you didn't understand?</p>	<p>There was confusion about which meteorites they saw were the lunar and which the asteroid or the martian. 'were the bigger ones worth more points?' (but this didn't seem to be the case!) 'Not really clear where the stones were' (6 year old)</p> <p>Text 'The text was too quick to read' (4 children)</p> <p>Refuelling 'How do you refuel - I got back to base but couldn't find where to refuel'</p> <p>Control for younger ones was sometimes an issue 'Difficult to slow down' (6 year old)</p>
<p>Did you like the challenges that arose?</p>	<p>'Yes – great' 'I wasn't aware that you could lose them' 'Yes – I had a problems steering but I liked crashing into ice-walls' 'Yes – hard near the pool' 'Yes – more action'</p>
<p>Did you like the landscape? Was it convincing?</p>	<p>'Snow and ice' 'Ice walls' 'Realistic' 'Tall snowy mountains' 'Good to look at'</p>
<p>Did you notice the tools?</p>	<p>Most used the speedometer with ease but less used the fuel gauge while no one used the weight gauge although</p>

	<p>some did know what it was and had noticed it. The map was frequently not noticed and only actually used by one boy.</p> <p>'Looked at speed a lot but not at the fuel'</p> <p>'I did the speedometer as I went along'</p> <p>'Didn't really notice other tools'</p> <p>'Didn't use the map'</p> <p>'I didn't see the map'</p> <p>'Difficult to do the activity and read the speed at the same time'</p> <p>'I didn't really look at the weight one'</p>
<p>What was the ending like</p> <p>Can it be improved</p>	<p>'It doesn't warn you'</p> <p>'An ok ending'</p> <p>'Not that exciting – ok though'</p> <p>'Rather a damp squib' (Mother)</p> <p>'I couldn't work out the different types of meteorite'</p> <p>'I had run out of fuel'</p> <p>'I didn't realise I had run out '(of fuel)</p> <p>'It was a bit of a surprise'</p> <p>'Dad told me it had run out.'</p> <p>'Yes I realised I had run out of fuel'</p>
<p>Can you think of any other improvements</p>	<p>'It would be good if you could see the skidoo going back to the base at the end.'</p> <p>'No – can I have another go?'</p> <p>'Different colours for different types of meteorite' (mother)</p> <p>'What are the flags for?'</p> <p>'Need to know which ones are the higher score ones.'</p> <p>'More action'</p> <p>'Other people collecting things'</p> <p>'Maybe a bigger fuel circle'</p>

3.1 Results from Schools

	What do you already know about meteorites?	Did you have fun, marks out of 10?	Why was it good?	How did you work out what to do?	What was the activity about (anything learnt about meteorites)?	Were there any problems/things you didn't understand?	Was the scenery convincing/good?	Did you notice or use any of the tools?	Was the ending good? How might you improve it?
1. Boy 7 yrs	Nothing	8 "good game but tricky to control"	"I liked that you could go anywhere"	Reading not good, told me he couldn't read instructions. Evaluator helped him.	"Learning about rocks" Learnt nothing new about meteorites	Didn't understand how to go back using controls	"looks real to me"	Noticed that there was a map. Used the speedometer	He didn't notice the ending and how many points he had got, didn't really understand
2. Boy 8 yrs	Nothing	10	"like games like that, go really fast and collect stuff"	"read instructions"	"had to go through Antarctica" In this game he learnt that "meteorites are good"	"in the beginning I thought asteroids were bad, you weren't meant to collect them (had to avoid them)"	"yes"	Used speedometer	He didn't understand how he had lost a meteorite. He liked the end but thought the game needed to be a bit longer.
3. Boy 8 yrs	"meteorites fall down to the earth and smash"	10	"you could really go fast and smash into stuff"	"I used hand controls"	Didn't know Didn't learn anything about meteorites	No	"not that real, wanted animals"	Used speedometer	He wanted 'congratulations' if you got a high score
4. Boy 10	Nothing	10	"you get to control it"	"read the instructions,	Didn't really know.	No	"Good graphics"	Used speedometer	He liked to know how many points

yrs				read a little bit about meteorites”				and said used map	he scored
5. Boy 11 yrs	Nothing	9	“liked graphics”	“read instructions”	“finding rocks in Antarctica” “have learnt that some meteorites fall into Antarctica”	No	“looked real but wanted animals”	He said he looked at weight and map	He liked it when he was told the hunt was over, he likes to know how many points he has scored.
6. Boy 10 yrs	Nothing	8	“looks like a car”	“read instructions”	“had to collect rocks” He still didn’t know anything about meteorites	No	“could have been better”. He wanted more up and downs!	He looked at speed and said he sometimes used map	He liked knowing the score at the end.
7. Girl 9 yrs	Nothing	10	“pushing forward and going backward”	She worked out how to use controls but didn’t know that she was collecting anything	No	She said she didn’t understand some of the words in the boxes at the beginning.	She wanted the water to be blue and there to be sound effects. Overall she thought it was quite	Used speed. She didn’t know what the map was.	She wanted it to say ‘game over’ at the end. Instructions at beginning too long for her, she was impatient and couldn’t understand why

							realistic		game hadn't started.
8. Boy 9 yrs	Nothing	10	"searching for rocks"	"the instructions"	"finding meteorites" He said he knew no more about meteorites	He didn't understand how you could actually get the rocks	He thought it was realistic	He used speed. He recognised the map but said he didn't use it.	Happy with the ending as it was.
9. Girl 8 yrs	Nothing	8	"using controls"	"read instructions"	"I knew I was collecting meteorites" She said she knew no more about meteorites	No	"realistic"	Didn't use any	She wanted a 'finish line'
10. Girl 8 yrs	"things that crash"	7/8	"you can go where you want to collect them and you are steering"	She said she had to guess what the meteorites were.	"not sure" She said she knew no more about meteorites	"at first I wasn't sure how to slow down but I worked it out"	"realistic but needed animals"	She used speed and looked at fuel. She said she also used the map.	Happy with ending.
11. Girl, 7 yrs	Nothing	8	"had to search for"	"I used the controls"	She didn't really know	"bit fast and had to try and work"	"there are no tents"	She used speed and	She would rather have 'well done'

			things”	(trial by error)	She said she knew no more about meteorites	out how to make it slower”	underwater, sleds are usually for land”	said she used the map a bit.	or ‘you could have done better’. She found it very hard to use the controls.
12. Girl, 7 yrs	Nothing	6	“I could look closely”	“I tried different things and then I got the hang of it”	“to try and find things (she didn’t know what these things were)” She said she knew no more about meteorites	She said she found the instructions a bit confusing	“quite realistic, needs animals”	Used speed.	She liked the ending.
13. Boy 13	Nothing	7	“you could drive it and turn”	“instructions at the start”	“collecting different types of rock” He said he now knows that there are different types of meteorites.	No	“needs to be better e.g. with snow falling”	He used all of them including the map	He wanted to drive into basecamp at the end and drop off the rocks
14. Girl,	Nothing	6	“it was like	From	“to find as	“didn’t	“quite	Used speed.	Ending was fine

<p>12 yrs</p>			<p>a mission”</p>	<p>instructions.</p>	<p>many meteorites as you can in the place that you are in and that you can lose them” “I now know that meteorites are like rocks and there are lots of types”</p>	<p>understand what the sea is – thought it was big rocks”</p>	<p>realistic, needs animals, plants, more stuff”</p>	<p>Knew it was a map but didn’t use it.</p>	
<p>15. Girl, 12 yrs</p>	<p>“a rock or something to do with rocks”</p>	<p>7/8</p>	<p>“trying to find different things”</p>	<p>“read instructions but they went a bit quick”</p>	<p>“collect different things and if you went into the water or other places you could lose them” “meteorites are types of rock in colder places”</p>	<p>“would be good to have a track you could follow”</p>	<p>“ok but you couldn’t see the sky”</p>	<p>Used fuel and speed. Knew it was a map, tried to use but bit difficult.</p>	<p>Ending good.</p>

4.0 Conclusions and summary

- More children understood the word snowmobile rather than skidoo.
- Some thought it was about the right length but others would have liked longer

- **Text at the beginning**

The information at the beginning needs to change in order. The first page needs to deliver the task and then the types of meteorite need to be mentioned and then the instructions on how to use the snowmobile – otherwise when the skidoo instructions are first they race through to use the activity and don't read the other information.

Instructions at beginning - go too fast, not big enough (tempting game very clear behind and kids just want to get cracking with this). Info about meteorites comes first and then the mission (wrong way around). Maybe just one big screen needed of clear bold instructions? (Nicky Boyd)

At the present time with the information in the wrong order children do not stop to read about the meteorites and learning is thus generally limited.

There are also issues with the speed of the information on meteorites – for younger children in particular who are a little slower at reading and do not manage to read it all before it has moved onto the next page.

- **Learning**

As a consequence of incorrect order and speed of page movement many children had a limited learning experience – the school children's interviews show in particular little evidence of understanding of what meteorites are after participating in the game. Of those that did learn something, knowledge focused on the three different types of meteorite.

A small group had clearly misunderstood the message '*meteorites are types of rock in colder places*' and thus it is important that this element of the introductory information is correctly timed.

- There are **issues in working out whether the meteorite is martian/lunar/asteroid**, as they do not look different in shape. Some thought that size was relevant and others could not tell the difference. This needs to be developed in the final version.
- Children like the landscape
- The control of the snowmobile is generally fine. They enjoy the challenges and feel that the speed and bumps add to the reality of the experience.
- Of the tools the speedometer is the most used. Some used the fuel gauge and very few the weight dial. Only one participant made good use of the map and many did not notice it. However those from the school interviews did use the dials and map more effectively (or said they did!). **The fuel gauge needs to be bigger as many failed to see it and thus were surprised when the game ended.** Those who had seen it wanted to know where to go to refuel.

- Children of different ages and abilities enjoyed it - even a 6 year old managed, although without help they had some problems unless they had watched someone else first.

Appendix

Skidoo

Observations:

How use?

Text?

Collect meteorites?

Do they refuel?

Tools

Other events?

Enjoy skidoo

Skidoo questions

Q1 was it fun?

1b Why?

Q2 What was the activity about? (Check for learning about meteorites)

Q3 Was the landscape convincing?

Q4 Did you understand what to do – did you read the texts?

Q4b Were there any problems?

Q5 Did you enjoy the challenges?

Q6 What did you think of the scoring system?

Q8 What do you think of the tools eg speedometer.

Q9 is the ending OK?

Q10 Any other improvements?

Children interviewed:

From the family day:

Boy 7
 Boy 14
 Boy 13
 Girl 10
 Girls/ 6 and 6
 Girl 11
 Girl 9
 Girl 7
 Girl 8
 Girl 5
 Boy 10
 Boy 9
 Boy 11
 Boy 12
 Boy 10
 Boy 9
 Boy 10

From the school day:

16.	Boy 7 yrs
17.	Boy 8 yrs
18.	Boy 8 yrs
19.	Boy 10 yrs
20.	Boy 11 yrs
21.	Boy 10 yrs
22.	Girl 9 yrs
23.	Boy 9 yrs
24.	Girl 8 yrs
25.	Girl 8 yrs
26.	Girl, 7 yrs
27.	Girl, 7 yrs
28.	Boy 13
29.	Girl, 12 yrs
30.	Girl, 12 yrs

Skidoo – Design Specification

23th February 2007

NHM visitor outcomes

- Visitors will have fun playing the skidoo game
- Visitors will know there are meteorites in Antarctica
- Visitors will be surprised by the unfamiliar Antarctic landscape

Key messages

5. Antarctica is an ideal location to find meteorites
6. Researchers use skidoos to look for meteorites in the Antarctica.
7. Research in Antarctica involves exploration and navigation.
8. Riding a skidoo is fun!

1. *Pre-Game*

1.1 *Attractor*

'Scan ticket to start' could be a message similar to 'insert coin' sequence in old coin-op games. The box also shows an animation of someone scanning their ticket.

Text: Scan your ticket to start.

1.2 *Language Select*

Need confirmation that language select is an –in-game user decision, or preset per terminal. Language select should be an in-game decision.

If required as user decision, will feature between attractor and intro.

(Could be done with flags)

1.3 *Intro*

1.3.1 - Base Commander appears on screen (still image- tbc).

Introduction text to be 'spoken' by Base Commander (Audio cannot be easily translated. 'Spoken' text should therefore be written onscreen)

Welcome to the meteorite hunt. Meteorites are rocks that have fallen from space. Your mission is to find as many meteorites as you can.

Watch out for dangers and return your rocks back to base camp.

1.3.2 - Instructions for using the Skidoo. This will visually reference user-operation e.g. hands on handlebars onscreen indicate right and left levers.

Pull the lever on the right to go forward.

Pull the lever on the left to brake and go backwards.

Go forward to start.

2. *In-Game*

2.1 *In-game scoring mechanism*

There will be three different meteorite types that populate the environment. Each type will appear visually and apparently different to the user, in terms of appearance and size. No further explanation is given.

The three different rock types are scored in descending order:

- Mars meteorites are the rarest.
- Moon meteorites are less rare.
- Asteroid meteorites are the most common and easiest to discover

Exploration is rewarded by the discovery of higher scoring rock samples.

At the end of game, when the users' meteorite total is counted, the three types of meteorite will dictate the final aggregated score (see 3.1)

Once you have collected a number of meteorites – eg 10, you have to return them to the base camp to empty the skidoo to look for more. You will also pick up more fuel to extend the mission.

2.2. *In-game Interface*

The following items appear onscreen at all time during the in-game experience:

1. *Fuel Gauge*
2. *Radar/Map*
3. *Speedometer*
4. *Weight (kg) – I think this might be being replaced with a meteorite counter*

2.3. *In-game warnings*

To limit on-screen interruptions, in-game warnings will be limited to game-objective alerts only.

Incidental obstacles or hazards will become apparent to the user through the use of discreet warnings (e.g flags or signposts) or by merely facilitating understanding through exploration and discovery.

Game-objective alerts

2.3.1. *Losing Meteorites*

<Appears on screen following collision with obstacle or other user>

Oh no! You've dropped some meteorites.

2.3.2 *Returning Meteorites*

<Appears on screen upon delivering meteorites back to base-camp>

Good hunting! x meteorites have been added to your total

Carry on hunting!

2.3.3 *Overloading Skidoo*

<Appears on screen when the player has collected more than a set value of meteorites>

Your snowmobile is getting heavy. Go back to base camp to unload your meteorites.

2.3.4 *Fuel Depletion*

< A Game Over message appears on screen when fuel runs out.>

Hunt over. Your snowmobile has run out of fuel and your hands are frozen.

Go back to base camp.

3. *End-Game*

3.1 *Table of Achievements*

Total number of collected items is displayed, divided into the three rock types.

Mars, Moon and Asteroid are then scored separately

This is then aggregated into a single score, providing a single, comparable record of achievement.

Pull lever to continue

3.2 *Score Interpretation*

Still image of the Base Commander. He gives you feedback about what you've collected and assesses how you've done, depending on the number of meteorites collected

Brilliant! You collected x meteorites
(OR- Brilliant! Your meteorite collection and scored x points - tbc)

I've sent your meteorites to the lab. Visit the Ice Station Antarctica website later. I'll need your help to identify what you found.

OR

Not bad! You collected x meteorites

I've sent your meteorites to the lab. Visit the Ice Station Antarctica website later. I'll need your help to identify what you found.

OR

Your skills might be better used in the lab! You collected x meteorites

Visit the Ice Station Antarctica website later. I'll need your help to identify the meteorites.