Noticing Tour: Kite Cam

Joyce Ma, Jackie Wong, Jessica Ruskin and Veronica Garcia-Luis

February 2005

THIS IS **NOT** A DEFINITIVE FINAL REPORT

FORMATIVE evaluation studies like this one often:

- **are conducted quickly**, which may mean
  - small sample sizes
  - expedited analyses
  - brief reports

- **look at an earlier version** of the exhibit/program, which may mean
  - a focus on problems and solutions, rather than successes
  - a change in form or title of the final exhibit/program

Outdoor Exploratorium
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BACKGROUND

From November 2003 to April 2004, Visitor Research and Evaluation conducted a set of front-end interviews that, in part, sought to identify outdoor activities visitors would find interesting for the Outdoor Exploratorium project. Among the activities we described to visitors was an outdoor activity, which we called Kite Cam, that would allow visitors to fly a digital camera mounted on a kite to take aerial photographs of the surrounding area. In the front-end study, we found that a large majority of our visitors were very interested in participating in such an activity should it be offered. In addition, visitors thought that Kite Cam would give them an opportunity to see things from a novel perspective. As one such visitor explained:

> Visitor74(Front-end): It's just, you could see things you could never see before. The idea of seeing things from a perspective you can't have.

The front-end results suggested that a kite cam outdoor activity would appeal to visitors and might be an engaging means of encouraging visitors to notice aspects of the outdoors from a new angle. Consequently, we decided to offer Kite Cam on a trial basis for three weekends during August, as a hands-on, hour-long, mediated outdoor activity that would serve both as a

prototype for an Exploratorium program and as a way to gain initial insight about the noticing that happens in such an activity.

PURPOSE

This study focuses on the noticing that happened during the Kite Cam activity we offered that August. It looks at the following questions:

- What type of noticing happens outdoors during a hands-on task where most of the focus is on a goal (in this case, on getting aerial photographs) that subsumes noticing outdoor phenomena?
- What type of noticing happens afterwards when visitors are inside and asked to look at and reflect on the artifacts produced outside?
- What types of questions do visitors ask about what they notice? (How) do they go about answering these questions?
- Does sharing what they notice with other people affect what they notice, and in what ways?

The results reported here are necessarily specific to one particular instantiation of a noticing experience. Nonetheless, we hope they can shed light on the noticing that happens or does not happen for an activity that is highly mediated, that predominantly happens outdoors but includes an indoor component, that is hands-on outdoors but reflective indoors, and that introduces opportunities to share across visitor groups.

METHOD

Materials

The Kite Cam rig (shown in Figure 1) consists of

- a digital camera,
- a shutter release mechanism made out of plastic gears and LEGO parts,
- a microprocessor (a LEGO cricket) programmed to trigger the shutter release mechanism every minute,
- and a battery to power the microprocessor.

These were all securely mounted on a 'cradle' made out of LEGO pieces. The entire rig was attached to two wooden boards and then suspended on strings that could be attached to the kite string. See Figure 1 .

We used a Sutton Flow Form 16 Kite, which provided the needed stability and the lift to carry the 1.5lb rig.

Activity

The Kite Cam experience consisted of two main parts. Each group went outside to the Marina Green with a facilitator to fly the kite and the camera rig to take aerial photographs. Then, they came back inside to the Exploratorium to look at the photos they had taken and to reflect on the activity.

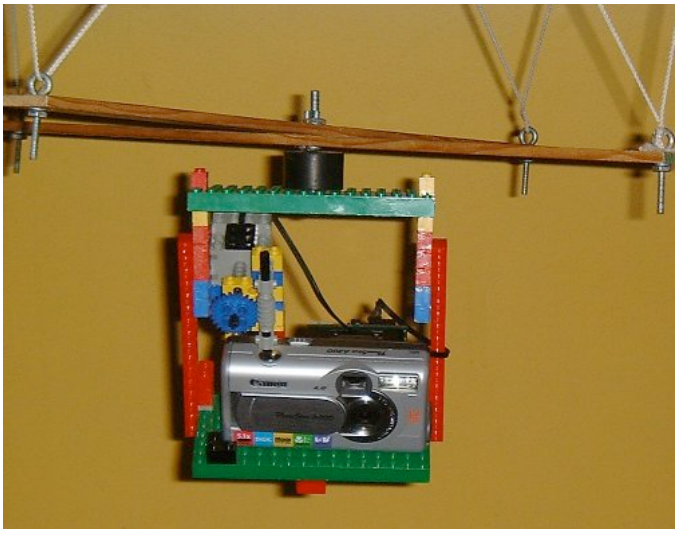
At the start of the activity, a facilitator met each participant group and gave a short, 5-minute orientation to the activity and the Kite Cam rig. To set expectations, she showed the group examples of aerial photographs that were taken by staff. See Figure 3 for one of these pictures. The facilitator also introduced the evaluator who would accompany the group throughout, taking notes of what the group members did and said and administering the interview at the end of the entire activity.

The group then went outside and with help from the facilitator spent about 40 minutes flying the kite with the attached camera rig. If time permitted, they could choose to re-launch the kite multiple times, changing the camera angle each time.[1] In addition, the facilitator encouraged visitors to estimate the wind speed and the height of the kite and had tools and techniques that would help visitors measure these values. These measuring activities were designed to supplement the kite-flying experience, to spark curiosity and to help answer questions that may come up.

Throughout, the facilitator coordinated the interactions between the visitors within each group, assigning different roles (e.g. string-holder, kite-launcher) to each person and encouraging everyone to work together and participate. She also helped visitors set up the camera, turn on the microprocessor, attach the rig, and handle the kite whenever visitors needed assistance flying the kite.

For the last 15 minutes of this experience, we asked visitors to come back into the Exploratorium to look at and print the photos they had taken with the digital camera. This was followed by a short interview. (The questions can be found in Appendix A.) At the end, we printed the group's favorite aerial photograph on quality paper, which they took home as a token of our appreciation for participating and providing feedback for this trial activity.

Figure 1. Kite Cam Rig with Camera Attached



[1] Camera direction had to be changed manually.

Figure 2. Kite Cam Rig



Figure 3. Aerial photograph taken by staff and shown to visitors



Participants

We offered the Kite Cam Noticing Tour as a public program for three weekends, from August 14 to August 29, with three time slots on each day. Study participants were recruited from the Exploratorium Membership and the general visiting public. A public program announcement went out in June as part of a bi-monthly newsletter to Exploratorium members and as an entry in the Exploratorium calendar. We also sent an email to our members letting them know about Kite Cam. Kite Cam was also posted as an event in the San Francisco Chronicle closer to August.

Because of the staff time required to facilitate this activity, we only accepted visitors who agreed beforehand to stay afterwards for the interview. Time slots were assigned to interested groups on a first come, first serve basis. Because the email and the announcement reached members first and because of the popularity of the program, all but one of the groups for this study were members, and that one exception was a couple we recruited off the floor because a member group canceled at the last minute. Although there were several groups who saw the listing in the Chronicle, by the time they called, all the time slots were already full.

Of the 18 groups that signed up, 10 groups came. One group was recruited off the floor to fill a canceled slot.

Table 1. Group Composition

Group Composition	Count
Members	
Adult Group	2
Adult with Children (Family Group)	8
General Public	
Adult Group	1
Total	11

Data Corpus

Three different sets of data were collected for each participant group. First, an evaluator took notes on what happened outside: what people said and what people were doing. They paid particular attention to questions visitors asked, efforts, if any, to answer these questions, and remarks visitors made about what they noticed during their experience outdoors.

Second, an evaluator took notes on the conversations visitors had when they were inside looking at their aerial photographs. These data give a sense of what visitors found interesting and curious about the aerial perspective. As part of these conversations, we asked visitors to annotate their favorite photograph, which we then collected and later analyzed.

Third, we interviewed each group at the end of the Kite Cam activity to determine their general reaction to the entire experience, both outside and inside. We also asked them questions around sharing: how seeing other photographs may have affected what they did outside or

looked for inside, what, if anything, they would like to share with other visitors, and if sharing their photos would influenced what they did outside.

RESULTS

The group is the unit of analysis in this study. We include visitors' quotes in the following as examples of what was said and to give a better sense of visitors' reactions.

The experience outside – Taking aerial photographs

What did visitors notice?

We looked at each group's conversation while taking aerial photographs outside, focusing on remarks visitors made about what they noticed and questions visitors asked each other and the facilitator. We found that many of these comments fell into five categories, as described in Table 2. One group's data did not contain enough details to code in this manner and is not included in this analysis.

Table 2. Coding Scheme for Conversations Outside

Coding Category	Remarks about…
Flying	how the kite is moving
Wind	wind
Perspective	what the camera sees
Technology	the technology, how it was put together, how the mechanism works
Outdoor	some aspect of the outdoors (except for wind)

- Flying. Not surprisingly, all the groups talked about how the kite was flying. Some visitors made predictions about how the kite will fly:

  Group01: I don't think it's going to fly.

  Group06: The thing will go up that way

  Some groups remarked on how it felt to fly the kite:

  Group02: Whoa!

  Group04: Eee! Off it goes!

  Many groups talked about how high the kite was:

  Group07: oh man, this is getting high

  Group10: It's pretty high!

  Group11: It's getting higher and higher

Yet, none of the groups made any attempt on their own to find out the height of the kite. They seem satisfied with a more general impression as opposed to a measurement or even a rough estimate. In all cases, it was the facilitator who prompted and encouraged visitors to estimate or measure the height of the kite. Furthermore, any subsequent investigations using tools to measure the kite's height was again instigated by the facilitator. Visitors were willing to pursue these investigations, once initiated. Some used the measurement tools (a protractor and a chart) we provided:

From Group03

D: (with kite reel) Well, it's getting high, that's for sure.
Facilitator: How high are we?
R: (Right away, definite.) 40 feet I think.
Facilitator: We can check if you're interested…
R: We'll play along! (R and J look at height chart.) Yup, 45 feet.

Others compared the kite to other objects in the environment to guess at its height.

From Group04

Facilitator - How high do you think it is now?
B- I have no idea.
Facilitator - Higher than fifteen feet?
B- Yeah. A basketball hoop is at fifteen feet, so.

- Wind. Every group talked about the wind, with most groups talking about how strong the wind felt. For example,

Group02: I don't think it's that strong anymore.

Group06: Oh the wind has died down

Group11: Yeah, it's fast wind

Again, few groups were interested in taking a more precise measurement with our anemometer. Instead, visitors 'measured' the wind through comparison:

Group01: Do you think there would be more wind if we were at the beach?

Group03: I know how fast the wind has to be blowing to make the trees blow like this at home.

Group10: The wind must be different [further] up there.

We also note that noticing the wind in our activity is a physical experience and not one that can be easily captured through observation or interview. Only one group talked about how the wind felt as it tugged on the kite:

Group06: The wind is so strong, I feel like I'm dragging something 100 lbs

So, noticing the wind can be visceral, which our method does not adequately accommodate.

- Technology. Visitors were interested in the rig and asked the facilitator questions about how we built it, how it works, and its specifications.

  Group03: How much shock can [the camera] take when it hits the ground?

  Group04: Is it going to be programmed to like take pictures?

  Group07: How will the kite fly if the camera is attached? I think it will be harder because it's heavier

- Perspective. We found examples of visitors' thinking about what the camera would see in every group's conversation outdoors. In these parts of the conversation, visitors were focused on taking a good aerial photograph:

  Group04: That would be cool if it took a picture right then

  Group09: Wouldn't it be neat if we got a picture of that cargo ship?

  Group10: Give me one more minute. I want to take one really high picture.

  They also thought about what would be in their photographs:

  Group06: I think it's taking a picture of the bridge

  Group08: I think you're getting the beach.

- Other Outdoor Phenomena. Four out of the 10 groups talked about outdoor phenomena apart from the wind. Some talked about the weather that day:

  Group03: Is it still warm out?

  Group07: It's raining…I felt a drop

  Group09: What a beautiful day!

  Group11: So is it foggy here three (quarter) times of the year? My experience every time I come here it's foggy

  The kite flying activity also led a few groups to notice other aspects of the outdoors:

  Group11: [trees are moving] Fast

  Group07: They [trees] are about 10 Nell's (estimating height)

  Group09: Has anyone ever been to that army fort over there?

  But, a majority of the groups stayed focused on the kite flying activity.

<u>What did visitors become curious about when they were outside?</u>

During the post interview, we asked what, if anything, visitors became particularly curious about *while outdoors*.

- Visitors (7 out of 11) were curious about how to take aerial photographs, including how the technology works

Group03- R: How the whole contraption was working.

Group04-M: I was curious as it went higher and higher how the camera was going to take pictures from that height.

Group08-V: If the thing that pushed the shutter button paused and then pushed it down or if it just pushed it down completely.

- Visitors (6 out of 11) said that they were interested in the photographs the camera was taking.

  Group01-W2: What subject for pictures

  Group05- W: How to best position the camera, I wonder if it's able to catch the bridge; how the angles would turn out

  Group07-M: how would we get shots of the harbor

- Visitors (3 out of 11) mentioned they were curious about how the kite flies

  Group04-M: How to make it higher

  Group06-H: How the kite can die and rise, etc.
  M: How to manipulate the string
  S: I was hugging it (the reel) because I might go with it

- One group became curious about the wind

  Group06-M: pay attention to the wind

These above results suggest that what piqued visitors' interests was the technology, or the 'how-to' for taking aerial photographs. Visitors were also curious about the photographs this process would give them. In other words, visitors' interests were largely on the process and its results. Noticing the wind was a secondary concern.

The experience inside – Looking at aerial photographs

After flying the kite, each visitor group returned to the Exploratorium and had a chance to look at their photographs and print out one to take home with them. This was also our opportunity to find out what they noticed in their aerial photographs.

<u>What did visitors notice?</u>

Although we took notes on what each group said as they looked through all their photos, we focused most of the conversation on the one photograph that they selected to take home with them. During this discussion, we encouraged visitors to annotate this photograph, describing what they found interesting, what they found surprising, and what they found memorable. See Figure 4 for an example of an annotated photo pointing out what the group noticed and found

interesting. Note that one group was unable to launch the kite and did not take any aerial photographs. This group was excluded from this portion of our analysis.

Figure 4. Example of an annotated photo – what one group found interesting



We then looked though the comments visitors made about what they noticed in their photograph and grouped what they noticed into 3 general categories described in Table 3.

Table 3. Coding Scheme – What visitors noticed in their aerial photographs

Coding Category	Remarks about…
Objects	Objects in the photograph
Composition	Relationships between objects in the photo
Dynamics	How the kite was flying when the photo was taken

- Objects. Visitors pointed out landmarks and other aspects of the landscape in their photographs, including the bay, the bridge, and the mountains. In general, they talked about large features of the landscape, although 7 out of the 10 groups also pointed out details in their photos. For example:

  Group05: Can see windsurfer [looking at photo]

  Group07: the bags on the grass

  Group08: It's the shadow of the kite.

  Group09: The detail in this building here reminds me of a village in a make-believe setting.

- Composition. Visitors talked about the spatial relationship between the different objects or landmarks in their photographs. These descriptions varied from talk about where something was to the overall perspective of the shot.

  Group02: a very good perspective

  Group05: The Palace of Fine Arts was over here

  Group09: how people looked in relation to the camera.

- Dynamics. Most groups (8 out of 10) described, oftentimes in amazement, how high the camera was when it took their photograph.

  Group04: how amazing it is to have the camera in the air so high taking pictures

  Group07: Oh, that's high!

  Group11: Taken at 150 feet above ground

  A few (2) groups also remembered how the camera was swinging and were pleased and surprised that the photographs came out so clearly, nonetheless.

  Group02: It came out so clear, even though the camera was moving around. I was expecting more blurry pictures.

  One group talked about how the kite and camera were moving when their particular picture was taken.

  Group05: I would remember the camera angle, that the camera rig was swinging around

What did visitors become curious about while inside?

As part of their post interview, we asked visitors if they became curious about anything as they were looking at their aerial photographs:

- Some (4) groups mentioned that they saw something in their picture that surprised them and made them wonder and ask additional questions:

Group03- D: This part [of the picture] that looks like interference. (points to wavy lines in the sky)

R: Is it real, or an anomaly in the way the picture was taken?

Group08-V: I was curious about the purple blob.

C: I was curious about how you could manipulate what you saw… Like Photoshop or focusing on something and checking to see more detail.

- Some (3) groups' curiosity was more an anticipation of the photographs they might have taken, an anticipation that was being satisfied:

Group03-R: There was an anticipation to see what the pictures would be like.

Group06-H: I didn't know what kind of pictures we would end up taking

M: We had no idea

- Otherwise, a few groups (2) had questions about the 'how to' of aerial photography and not about the photographs themselves.
- Two groups claimed that looking at their photographs did not make them curious about anything.

In general, we found that during this indoor activity, visitors spent little time making detailed observations of what their aerial photographs captured. This may be in part because the activity is long and visitors were tired after flying the kite outside. The more reflective indoor activity may have been anticlimactic after the excitement of flying a camera outside for 30 to 40 minutes. We note that in one group, only the adults were willing to stay to look at the photographs past selecting the group's favorite. In another interview, the children sighed audibly during the indoor activity, and in yet another, one person asked if they 'could go now' before the interview ended. Although the evaluators and facilitators tried to encourage explication, they felt that it was difficult to obtain very much beyond very short answers to our interview questions.

Also, the activity encouraged visitors to select one photograph to take home with them as a gift for participating in this experimental activity. Consequently, visitors saw the photographs as mementos of their outdoor experience for the day rather than something to study very carefully as part of the post-flying activity.

The experience in general

All of the 11 groups thought the Kite-Cam Noticing Tour was worthwhile. In fact, they were all willing to pay $8/ group for this experience if it were offered as a public program. They felt that the program was worthwhile for several reasons:

It's a unique activity (6)
They enjoyed being outdoors and doing something outdoors (5)
They enjoyed doing something as a group (3)
It's fun (no further explanation) (3)
They enjoyed flying a kite. (3)
They liked taking pictures (from a kite) (3)

It's a different way to see (2)
It's a unique setup/ lego rig (2)
It's nostalgic (1)
They liked helping with feedback (1)
They enjoyed the process - setting up camera, etc (1)
They learned something (1)
Kids liked it (1)

Sharing the experience

Finally, we looked to see how sharing might influence what visitors do or notice.

How did seeing other people's photographs affect what visitors tried to do outside?

When asked, 4 out of 10 groups said that looking at photographs beforehand affected what they tried to do outside. More specifically, these visitors felt that

It influenced the picture content (2).
They were spurred to fly their kite higher (2)
They felt inspired (1)
It showed what was possible (1)

Six of the 10 groups felt that seeing other photographs did not affect what they did outside. Some of these visitors (2) were simply not impressed by the photographs they saw before they went outside. One visitor explained that since they had no control over the kite, seeing other people's photographs did not make any difference to them.

How did seeing other people's photographs affect what visitors looked at in their own photographs?

Most (6 out of 9) visitors did not think that seeing other people's photographs affected how they looked at their own. Some of these visitors simply did not remember the photos they saw earlier. One visitor did not feel that the photographs were at all comparable.

A few (3) groups thought about the other photographs and made comparisons between the pictures' content:

Group07-K: the grass [was similar]

and quality:

Group09-D: I thought ours were much better.
M- Yeah. Yeah.

Did visitors want to share their experience with other people?

Most (7 out of the 11) groups did not think about sharing their experience with other people while they were flying the kite. The remaining 4 thought about their family and friends who were not with them for Kite-Cam but who, they thought, would appreciate the experience.

However, at the end of the experience, 10 out of the 11 groups wanted to share their photographs with other visitors and let them see the pictures they took with the kite camera. These visitors explained that they wanted to show other visitors their photographs because they were proud of what they did and wanted to encourage others to try the activity.

In addition, we asked each group to write on their photograph what they would want to tell other visitors about the Kite Cam activity. We found that their comments fell into four broad categories

What they did when they were outside (5)
Things to notice in their particular photograph (4)
How fun they thought the experience was (2)
'How to' advice (2)

Only two groups passed on advice that they thought other visitors might find useful in taking aerial photographs with Kite Cam.

DISCUSSION AND SUMMARY

In general, visitors found the Kite-Cam Activity engaging and worthwhile. They thought their time was well spent and enjoyed their experiences. Although this activity was offered for free, every group claimed that they would have paid to participate.

The data also suggest that visitor groups were tightly focused on the express goal of taking aerial photographs with our kite camera. Visitors were interested in how to take aerial photographs and talked, asked questions and wondered about the technology and the camera's perspective while they were outside. Although they also talked about how the kite was flying and how strong the wind was, these observations were in service of the larger goal of the activity. For example, visitors were interested in the wind because they were concerned about whether or not it would be able to lift the camera.

Also, tasks that did not seem to satisfy the larger goal felt extraneous. For instance, we had designed two measuring tasks in our activity, one to measure the wind speed and the other to measure or estimate the height of the kite and camera. However, we found that the facilitator had to initiate these tasks, and in a few cases, visitors admitted that they were 'playing along.' And, when the facilitator did not push hard on a measuring task, it was simply dropped by the group. We also found that even if a group was interested in how high the kite was or how strong the wind was, they were not necessarily interested in an absolute measurement. This may be because absolute measurements may have little meaning to someone who doesn't know what a 10mph wind does or how tall 100 feet is. Instead, we saw examples of groups trying to relate these measurements to other, more relative measures within their experiences. For example, one group talked about how high up the kite was according to how many 'Nell' (one of the visitors in the group) high it was, and another group described how strong the wind was by how strong they think it needs to be to move the trees in their neighborhood.

We had hoped that these measurement tasks would be another way of encouraging visitors to notice the outdoors. However, both observation and interview data suggest that visitors' main interests while outside remained firmly in the process and technology of taking photographs with a kite.

Looking through our notes of the indoor activity, we had the general impression that many of the groups saw the indoor activity not as much as a chance to make detailed observations about what they saw in their aerial photographs, but more as a type of delayed feedback for what happened outside. That is, they were curious about the general quality and type of photographs the kite camera and their kite flying captured. This is understandable seeing that the setup does not allow visitors to control their picture's composition beyond allowing them to point to a general direction of interest. This may have amplified the anticipation or the 'surprise' in looking at the photographs indoors that eclipsed any close analysis. A few visitors explained:

> Group01- C: The fact that it's random is interesting…that unknown.
>
> Group03-R: To me, the not knowing [what the pictures would be like] is all the fun.
>
> D: (In agreement with R on anticipation of not knowing.) But only the first time out. If you could control it, it would be better.

We hoped that visitors' surprise would prompt them to ask questions about what they can see in their photographs and to possibly try to answer these questions through further exploration. However, the amount of time between taking aerial photos with the kite camera and looking at these photographs was perhaps too long to allow visitors to ask anything beyond some initial questions about what they saw in their pictures. Furthermore, looking at the photographs came after visitors had already spent about 40 minutes outside; visitors may simply have been tired by the time we brought them back inside to see their photos.

Nonetheless, we were encouraged by some of the details that visitors began to notice and the questions some groups began to ask:

> Group08-V: I don't know what that is. It just looks interesting. Everything else is green, this is purple.
>
> Facilitator: Did you see that when you were out there? Or did you just notice it now?
>
> V: I just noticed it now.
>
> V: It's the shadow of the kite.
>
> V: I don't know what that is.
>
> Facilitator: It looks like it could be a bird or seagull or something.
>
> C: That's what I was going to say.
>
> V: Those two things look like gigantic birds.

These data point to a key tension in this activity: Although we wanted to foster noticing, visitors were largely focused on flying the kite to take aerial photographs. It is possible that the close noticing that the Outdoor Exploratorium tries to encourage is more likely to happen with more time and experience with the aerial photography.

Finally, this study collected some initial data on how sharing activity artifacts can affect visitors' experiences. We found that although most visitors were eager to share what they did and saw,

fewer groups reported being affected by other people's aerial photographs that we showed them. This, however, is preliminary data for a long activity in which sharing was a small component. We will continue to study how sharing, as well as other activities, can affect noticing in our exhibit prototypes in the future.

ACKNOWLEDGEMENTS

The authors would like to thank Fay Dearborn, Debbie Kim, Heather Posner, and Annie Lien for conducting the interviews and making detailed observations of the outdoor activity, and Annie and Debbie for help coding parts of the data.

This material is based upon work supported by the National Science Foundation under Grant number 0104478. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.



APPENDIX A: Interview

General

1. In general, did you find this activity worthwhile? YES NO

2. In what way was it worthwhile / not worthwhile?

3. If we were to charge $8 for this activity, would you still sign up for this activity? [$8 for each group]

4. Do you have any suggestions for improving this activity? What?

5. Was there anything you wanted to do that you did not get a chance to do during this activity?

Sharing

6. We showed you some photographs that other visitors took with the kite camera.
    a. Did seeing those photographs affect what you tried to do while outside? How so?
    b. Did they affect what you looked at when looking at your own photos? How so?

7. While you were outside, did you at any time think about the people you would show your photos to? Were those people
   [*Circle all mentioned*] Friends Family Other Visitors?
    a. Did thinking that friends/family/other visitors [*pick the rightmost one*] would see your photos affect what you tried to do outside? How so/ why not?
    b. Did it affect what you looked for in your photos? How so/ why not?

Inquiry/Curiosity

8. Did you become curious about anything in particular
    a. When you were outside? What?
    b. When you were looking at the photos inside? What?

9. Did you feel that you had a chance to adequately explore some of these things in this activity? YES NO
    a. [*If YES]* What?

10. Did the activity increase your curiosity? YES NO
    a. [*If* YES] About what?

11. Did the activity satisfy your curiosity? YES NO
    a. [*If* YES] About what?