

**Life in a Square – Week #1**  
**Eye spy with my little eye something that is...?**

Notes:

1. **Bolded items** are questions to help facilitate discussion
2. *Italicized items* are things that need to be included in the journal you start creating with the kids through GoogleDocs.
3. **Highlighted items** are things that you guys need to bring with you on Saturday.
4. **Coloured font** is a special note just for you to be aware of.

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Learning Objectives:

- How to use various scientific tools to help collect data.
- To begin to understand the difference between observing and inferring and how to use both to formulate explanations.

Materials

**Engage:** Seven Blind Mice book, name tags, drawing paper and crayons/markers.

**Explore:** 2 clipboards per group one with lined paper for writing and the other with white paper for drawing, a meter stick, 4 pegs, and a very long piece of yellow yarn. Also a baggie of supplies – 2-3 hand lenses, measuring tape, a thermometer, popsicle sticks, food colouring, pencils + crayons, 2-3 sandwich baggies, **camera**

**Explain:** whiteboard, markers, and erasers, computers for Google Docs, baggie of supplies still,

**Elaborate:** nothing

**Evaluate:** nothing

\*\* This lesson will take approximately 2 ½ hours.\*\*

**Engage. Introduction to each other (because it is week 1) and introduction into today's activity.**

- Welcome everyone and organize groups.
- Everyone will have a chance to get their name tags.
- Groups will have 5-10 minutes to play a get to know you game. This includes: a drawing activity where each member of the group draws a picture of their favorite thing---no labeling because the others will have to guess what this thing is simple based on what they observe in the drawing. The drawer can provide hints for team members to guess what it is. After it is correctly identified then the drawer explains why they chose this thing (why it is important to them). Everyone gets a turn and these pictures can be kept in the coloured folder for a reintroduction of names the next week.
- Meredith explains to everyone what they will be doing for the next few weeks – what the Life in a Square is—and explains today's activity.
- She begins with reading the book “Seven Blind Mice”. Q’s for discussion: **How were the mice describing the object? What was limiting them from knowing what it really was? How did the seventh mouse know what it was? ---goal of the conversation is to have the students realize the need for multiple pieces of evidence (many observations and inferences) to understand the whole.**

### **Explore. Going outside – setting up and collecting data.**

- When outside each group will select a location somewhere near the SOE---between 7<sup>th</sup> street and residence halls south (North and South limits) of the SOE and Jordan and Rose (West and East limits).
- To set-up the square each group needs to using a measuring tool to mark out a 1m by 1m square area and use the pegs provided to mark the four corners and the yellow string to outline the square.
- Once the square is set-up the students begin to make observations – collecting as much data as they can about the square and the area immediately around it---be sure to differentiate the data from that found in the square to that found outside. Remember that the square is 3D so if you included a tree in your square the whole height of the tree is included as data in the square.
- Also, go below the surface of the square – if there is snow, dig under but perhaps disturb only a section and not the whole thing for the sake of comparison. If there is no snow in a part then look through the leaves and grass to the soil below.
- Hand lens are provided as well as small sandwich bags to collect samples of items from the square for further investigation inside. Popsicle sticks are provided to help dig around the square without disturbing too much at once. The food colouring is provided to mark a particular area of interest in the snow (later we can use little flags to mark these sort of things, but it is difficult in the deep snow). If you do use food colouring be sure to record somehow what each spot was identified for.
- Each student needs to take turns recording data they observe – both written and pictorial.

### **COME BACK INSIDE - BREAK – SNACK TIME**

### **Explain. Starting to tell the story – interpreting the data.**

- Since this is only the first week there is nothing to compare the data too. So the conversation this week will focus mainly on identifying data that was recorded as observation and that which is inference-based.
- Using the white-board provided have the students go through the data they listed (maybe not all, but several pieces) and indicate those that they were able to collect through direct observations (using their senses or with the help of a scientific tool – e.g., hand lens, thermometer, measuring tape, etc.). Then in the other column list those items that they understood or identified because of a previous experience they had or an assumption they were making about it. **Talk about these differences and why scientists might need to look at both kinds of evidence when trying to explain something.**
- Prepare all of this information into GoogleDocs – set-up the online journal. For your journal entry this week include the items below in *italics*.
  - *The date and group members names*
  - *A list of all data collected and a visual representation of the data too – example a photo, drawing that you scan in later and load up, a table of items collected and a graph representing these...whatever your group chooses.*

### **Elaborate. Application of information.**

- Next, look at all data collected and collectively (as a group) tell the story about why the objects you saw or collected make sense or don't make sense to be in your square. **What**

**are some thoughts as to how the “not make sense items” got there, why are they there and what evidence can be used to support these ideas?**

- *Include this “story” or explanation in your group’s journal being sure to carefully indicate the supporting evidence and why it helps to support the students’ explanations.*
- Have a discussion within your group about how using the tools helped with data collection. **Would you have learned some of things you did without it? Why is it important for scientists’ to use particular tools to help them...can anyone think of another tool scientist might use to help them observe and how would they use it?**
- Finally, from the data collected this week discuss as a group something that you would like to keep tracking each week and give a reason why. Make some preliminary predictions about what you think you will see with regards to this item next week and why you think this.
  - *Record this preliminary prediction in your group’s journal and the reasoning behind it.*

**NOTE:** if your group chooses something to track that requires them to manipulate the square in some way this week then this is the time to go and do it. We’ll have to watch the time to see if you have time as a group to do this, or if you might need to do it for them after the session.

### **Evaluate.**

- No formal (summative) evaluation this week – you completed some informal (formative) evaluation of the learning objectives throughout the lesson with discussion and these ideas are ones that we will continue to build on over the next five weeks. They are not ready for formal evaluation yet.
- Therefore, to wrap things up I want you to decide on a group name and add this to the top of your Life Square journal in GoogleDocs.
- Also, each group will take a few minutes to share out with the rest of the class 1) where their square is located and 2) the thing of interest they are going to track over the next few weeks and why. Meredith will facilitate this discussion.

**\*\*NOTE:** this sharing out time at the end will occur each week. This will take the last 10-15 minutes of class and gives everyone a sense of what everyone else is doing, examining. This is to develop our “community of science” and to eventually lead to a comfortable setting where kids can begin to challenge each other’s ideas.

**Life in a Square – Week #2**  
**Can some evidence be more useful than other evidence in science?**

Learning Objectives:

- To evaluate the usefulness of evidence in formulating explanations and assessing predictions.
- Continuing with learning how to use various scientific tools to help collect data.
- Continuing with developing an understanding of the role of observation and inference in formulating plausible scientific explanations.

Materials

**Introduction: colored folders with pictures from last week, weather book**

**Lesson:**

**Engage:** \_colored folder, drawings from last week\_\_\_\_\_

**Explore:** clipboards, large Ziploc bag of tools/instruments, camera (PSTs responsible for this), \_\_\_\_\_

**Explain:** whiteboard, markers, and erasers, computers for Google Docs, \_\_\_\_\_

**Elaborate:** computers for Google Docs, Paper\_\_\_\_\_

**Formative Assessment/Evaluation (embedded throughout):** \_\_\_\_\_

**Closing Wrap-up: peanuts, Ziploc bags, sentence strips, markers**

\*\* This whole lesson will take approximately 2 ½ hours.\*\*

**Introduction --15 minutes**

- Begin with a having everyone reintroducing themselves this week using the pictures they drew from last week---can their table mates remember what the pictures were about, what the illustrator's name is, and why they chose to draw that item? The new PST will introduce themselves at the end of the round with their picture (I will have you draw this before class starts).
- Ask the kids what kind of information or evidence do they think meteorologists (those who predict weather) use to help them with their predications? We will make a list on the board. I will then share a book called "What will the weather be?" and afterward we will compare our list with what the book listed. We'll talk about similarities and differences in evidence used on these two lists and maybe why some information/evidence might be more helpful than others in predicting the weather.
- Lead this into introducing today's activity: When they are outside collecting today they need to keep track of data they think will be most useful in helping them to assess the accuracy of their predictions from last week. Also, considering these predictions what is something they might want to gather evidence on that they didn't last week.

**Lesson**

**Engage.**

- Ask students if they can remember last week's observations and predictions.
- Write down anything they can remember on a piece of paper. What evidence was collected?
- Discussing if the predictions occurred. If predictions have changed, explain why.
- Go to Google Docs to look at photos and read last week's predictions.
- How did evidence support predictions?

**Explore.**

- Have students go outside to observe life square.
- Has anything changed? Predictions true?
- Record new observations.
- Draw a new diagram that includes observations.
- Make sure to include: snowfall amount, food coloring, temperature, and footprints.
- Collect any samples.

**COME BACK INSIDE - BREAK – SNACK TIME****Explain. (GoogleDocs)**

- Discuss new findings and observations.
- Record observations on white board.
- Compare data with last week's data. Did anything change?

**Elaborate. (GoogleDocs)**

- What can we predict will happen next week based off of our observations from this week?
- What kind of observations did we make that will support our predictions?
- What can you tell me about observations and inferences?

**Evaluate.**

- Formative---how will this be embedded throughout so you know whether or not your kids are getting the ideas set out as the learning objectives?
- We will be asking them various questions throughout the lesson. Getting them to think about their investigation and how to make good observations and predictions. We will need to use open-ended questions to see if the children are understanding the ideas or not.

**Wrap-up/Closure ---30 minutes**

- I will pose a new variable to each group with having them place a set number of peanuts in their square.
- They will need to determine as a group where they want to and how they want to put these in their square (e.g., all spread out, some buried and some on top, placed in pairs, all put together, most inside and one just on the outside, etc.)
- On the sentence strip provided they need to put where and how they are placing the peanuts in the square + their group name (this is side 1). On the other side (2) they will write their group's prediction about what will happen to the peanuts over the week and why they think this. They must use evidence they have collected so far to support their reasoning.

**Life in a Square – Week #3**  
**Is there evidence to support my predictions?**

Learning Objectives:

- Learning how to interpret the evidence so that predictions are made based on the patterns of the evidence.
- To continue assessing the usefulness of some evidence over other evidence when formulating explanations and making plausible predictions.
- Continuing with learning how to use various scientific tools to help collect data.
- Continuing with developing an understanding of the role of observation and inference in formulating plausible scientific explanations

Materials

**Introduction: GoogleDocs and whiteboards, sentence strips the groups developed last week**

**Lesson :**

**Engage:** \_red folder, sentence strip from last week \_\_\_\_\_

**Explore:** new packet of seeds, clipboards, large Ziploc bag of tools/instruments, camera (PSTs responsible for this), \_\_\_\_\_

**Explain:** computers for Google Docs, clipboard with observations \_\_\_\_\_

**Elaborate:** \_\_\_\_\_

**Summative Assessment/Evaluation (embedded throughout):** \_\_\_\_\_

**Closing Wrap-up:**

\*\* This whole lesson will take approximately 2 ½ hours.\*\*

**Introduction---30 minutes**

- I will begin with holding a discussion about the sentence strip prediction each group made last week. Sample discussion questions include: what does each sentence tell us? According to each strip, what kind of evidence should we be looking for to help us determine if our prediction and our reasoning is correct?
- Each group will be given a white board and will be asked to return to their computers to look at their evidence to determine how they could provide a prediction that is based on evidence. On their whiteboard then they will jot down all potential predictions and will come back together as a group to select the one that makes the most sense and will rewrite it on a sentence strip.
- Each group will present their new sentence strip and I will post in class for them to refer to after they come back from collecting their new data.

## Lesson

### Engage.

- Based on the conversation we just had devise a plan for what kind of data to collect--- create a chart on your clipboard, designate jobs to who is collecting what info, etc.
  - What evidence did you observe in order to create the first sentence strip?
  - What evidence would you expect to see in order to make the first prediction?
  - What evidence did you gather from last week? Were there any animal prints?
  - What type of data do you think we should gather this week?
  - How can we go about collecting the new data this week?
  - Do you expect to see anything new in the life square?
  - What type of things should we observe about the seeds?

### Explore. Going outside – collecting new data.

- Why did you place last week's seeds where you did?
- Where do you think we should place this week's seeds? Explain!!!!
- Did your prediction from last week about the seeds occur?
- Did you notice any patterns about the seeds? Did location effect the outcome of your prediction?
- How have the seeds changed? Color? Size? Are there any seeds missing? Have they been moved?
- How do you think we should go about collecting new data? What should we look at?
- Has something happened to the square itself? Has anything been in the square?
- How has the weather affect the life square and the seeds?

## COME BACK INSTIDE - BREAK – SNACK TIME

### Explain. (GoogleDocs) Telling the story – interpreting the data (explanations)

- Did you find any evidence to support your previous prediction about the seeds in the life square?
- What new observations did you make while outside?
- How had the seeds in the life square change? Was there a pattern? Were you surprised by the new data?
- How reliable do you think our evidence and observations are?
- Why is it important to have reliable evidence from the field?
- What would happen if our data was not correct?
- Do you think anything could have changed our square or seeds? If so, what?(People or animal?)

**Elaborate. (GoogleDocs) Application of information.**

- We are going to conduct an investigation specifically for our life square. What would you like to investigate for the final three weeks?
  - o Has something specific happened each week that has caught your attention?
  - o What are some ideas for our investigation?
  - o How could we explore our new investigation?
  - o What might we test each week to support our investigation?
  - o What tools and materials might we need?
  - o How and in what ways will we collect the data each week?
  - o Why is it important to observe the same data over a long period of time? What might the data tell us?

**Evaluate.**

- Formative---this will be embedded throughout with the questioning techniques you use.
- Summative---you need to develop something at this point that will help you to assess their understanding so far about the connection between evidence and generating explanation
  - Make a chart for each week thus far, with one column being the evidence we have found each week and the second column being the explanation and how that evidence has been important.

**Wrap-up/Closure ---20 minutes**

- Each group will be given a couple of minutes to present their “investigation idea” to the rest of the class and their reason WHY they want to investigate this. You will submit your materials list to me then. Be sure you have discussed who is presenting this in your group



**Life in a Square – Week #4**  
**How can my inferences help me explain?**

Learning Objectives:

- Delving deeper into understanding the difference between observation and inference. How can inferring from prior knowledge or experience help with explaining, but why can I not rely solely on inferences when providing evidence to support my thinking?
- Learning how to interpret the evidence so that predictions are made based on the patterns of the evidence.
- To continue assessing evidence when formulating explanations and making plausible predictions.
- Continuing with learning how to use various scientific tools to help collect data.

Materials

**Introduction:** whiteboards, markers, brushes

**Lesson:**

**Engage:** \_\_\_ Whiteboard, markers, googledocs \_\_\_\_\_

**Explore:** new packet of seeds, (radish, green bean, bird seed, corn seeds) clipboards, large Ziploc bag of tools/instruments, camera (PSTs responsible for this), shovel, tape, string  
\_\_\_\_\_

**Explain:** computers for Google Docs, \_\_\_\_\_

**Elaborate:** computers for Google Docs, \_\_\_\_\_

**Summative Assessment/Evaluation:** \_\_\_paper and pencil\_\_\_\_\_

**Closing Wrap-up (MPR):** whiteboards, markers, brushes

\*\* This whole lesson will take approximately 2 ½ hours.\*\*

**Introduction---20 minutes**

· I will begin with asking each group to share one of their predictions they made for this week (I'll give time to return to computers if needed). I will specifically ask them to list out what evidence they used to support this and to explain why they used this evidence.

· The groups will use the whiteboard to create a T-table---one column is the evidence for their prediction and the other is their explanation for why they used it.

· Groups will share using the whiteboards to help them out. Other groups will be asked to confer at their tables about whether or not the evidence makes sense based on the group's reasoning (their why) for using it...*this is leading to the students developing the ability to present logical evidence-based arguments in science and to challenge each other with perhaps alternative ideas.*

## Lesson

### Engage

- Objective: Learning how to formulate an investigation question based on evidence.
  - Students will review and discuss last week's predictions.
    - What did you notice about the life square last week?
    - Do you think any of your predictions will be true this week?
  - Discuss what changes might have occurred over the previous week and why.
  - As a group, students will come up with an investigation question for their life square that they want to focus on for the remaining weeks.
    - What would you like to explore more about the life square in particular? Is there anything interesting happening within the life square?
  - Based upon, the investigation question, students will decide how they would like to explore their question.
    - What materials might you need?
    - How will you use those materials to help you find out the answer to the question?
    - Do you have evidence to support this investigation from any of the previous weeks?
    - Why did you pick this specific question?

### Explore. *Going outside – collecting new data and set-up for new investigation.*

- Objective: Continuing to make observations and collect data. Setting up materials for the investigation question.
  - Students will observe and collect new data from life square
    - Students will draw pictures and record information about life square
  - Students will set up materials for investigation question
    - Make new observations about the set up of materials for investigation
    - Draw a picture of investigation set up.

## COME BACK INSIDE - BREAK – SNACK TIME

### Explain. (GoogleDocs) *Telling the story – interpreting the data (explanations) for the second planting of seeds.*

- Objective: Learning more about the difference between inferences and observations. Using data to explain what has occurred throughout the week in the life square. Understanding the importance of setting up an investigation.
  - What evidence did you find this week that supports your predictions for what would happen?
    - What do you think has occurred in our square this past week, do

- you have any evidence to support your thinking?
      - Why do you think what occurred throughout this past week happened?
- What is the difference between something that you see and something that you know has happened?
  - For example, how do we know what kind of animal has eaten the seeds? It is possible for us to know what kind of animal has been in the square?
  - How often do you think we infer information without realizing it?
- Should we set up the life square again? How would that impact our investigation?
- What is the importance of conducting an investigation?

**Elaborate. (GoogleDocs)** *Application of information and journal prep for “new” investigation”.*

- Objective: Creating a new investigation and understanding the importance of controlling certain parts of the investigation/experiment
  - Based upon the investigation question students will go outside and set up their investigation.
  - They will draw a diagram of their new investigation.
  - Why did you set up the investigation in a certain way?
    - How will the design of the investigation help us determine an answer to the question?
    - What do you think will happen by next week? Explain your thinking?
    - Why did you use the materials you used? How did they help you set up the investigation?
    - Do you think we will be able to have an answer to our question by next week or will it take a few weeks to determine an answer?

**Evaluate.**

- Formative----this will be embedded throughout with the questioning techniques you use.
- Summative---
  - Students will write down their predictions for week five on a piece of paper. This will be done individually and students will be asked to explain why they have made those predictions using evidence from past weeks.

**Wrap-up/Closure (MPR) ---10 minutes**

- Each group will be given a couple of minutes to present what they learned about their square this week and what they think their “investigable question” will tell them next week. They will be asked to write out their actual “research question” on the whiteboard to share with everyone.

**Life in a Square – Week #5**  
**Finding the right evidence to support my argument.**

Learning Objectives:

- Evaluating the quality of one's research design in answering the guiding research question. (e.g., were variables controlled as best as they could?)
- Continuing to develop an understanding about the difference between observation and inference.
- Learning how to interpret the evidence so that predictions and explanations are made based on the patterns of the evidence.
- Continue developing skills to evaluate evidence and its usefulness.

Materials

**Introduction: whiteboards, markers, brushes**

**Lesson:**

**Engage:** \_\_\_\_\_

**Explore:** new packet of seeds, clipboards, large Ziploc bag of tools/instruments, camera (PSTs responsible for this), list of other requested materials from last week for new investigation

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**Explain:** computers for Google Docs, \_\_\_\_\_

**Elaborate:** computers for Google Docs, \_\_\_\_\_

**Summative Assessment/Evaluation:** \_\_\_\_\_

**Closing Wrap-up (MPR): whiteboards, brushes, markers, sentence strips, regular markers**

\*\* This whole lesson will take approximately 2 ½ hours.\*\*

**Introduction (MPR)---10 minutes**

- Begin by asking each group to revisit their investigation question again.
- Using the whiteboards create 2-columns: 1) the data they will collect that will directly answer their question, 2) data they will collect that may not directly answer their question, but they feel is still important to record.
- They will be asked to share this list with the other groups + explain why they think the other data (2<sup>nd</sup> column) is still important to collect even if it doesn't directly answer their question.

**Lesson**

**For your two hours you must plan for each of the following phases. Please be sure that you include what your objective is for each phase so you know what you want to accomplish in each and also list potential guiding questions and assessment tasks you will use throughout each phase to determine if the students are understanding and meeting your objectives.**

## Engage

- Objective: Discussing the importance of investigation (what kind of animals visit our square?)
- What process did you take in forming your investigation? Can you explain?
- Would it have helped to do something differently?
- What were your predictions and observations from last week? What evidence did you find last week to influence your predictions? How will we know if our predictions are accurate?
- What do we want to focus on this week? Observations? Predictions? What tools do we need to use?

## Explore. *Going outside – collecting data.*

- Objective: Learning more about data collection based on the accuracy of predictions.
- Make observations.
- What happened to the different seeds? Is the tape still on the tree? Did the weather have an effect on the seeds?
- What did we control in our investigation?
- Why is it important to control certain variables?
- What should we change to better our investigation? Do we need to change anything?
- What about our actual investigation question? Does it need to be changed? Or made more specific?

## COME BACK INSIDE - BREAK – SNACK TIME

## Explain. (GoogleDocs) *Telling the story – interpreting the data formulating the explanations.*

- Objective: Discussing the importance of controlling certain aspects of the investigation.
- What parts of the investigation helped determine the accuracy of your predictions from last week?
- Did we set up our design to support our investigation question? Does our design need to be changed?
- Did the evidence we collected support our investigation? Should we focus on something more specific?

## Elaborate. (GoogleDocs) *Application of what was learned about the investigation question and assessing the quality of their research design. **They will consider any changes they want to make to their research question and design, then if need be they go back out to their square to make the changes they suggested.***

- Objective:
- What can we do to help us with our investigation? What variables can we control to help us with our investigation?
- Should we set up our square?
- What do we need to do differently.

## Evaluate.

- Formative---this will be embedded throughout with questioning and other short check-in assessment techniques.
- Summative---in the elaboration phase you will be assessing (as a group) the quality of your research design from the previous week based on what you experienced this week---this means, were you considering the right kind of data to collect, did you consider all factors that might influence your square, did you control for any variables you needed to (or could), etc. THEREFORE, at the end of this lesson I want you to have your students to individually complete some sort written task where they show to you their thinking process for designing this investigation and redesigning it.
  - *Examples of things they might include in their process of thinking:*
    1. how did they come up with their question in the first place
    2. how did they refine their question from week 3 to week 4
    3. how did they decide what data to collect to answer it
    4. once they collected the data how did they determine what data best answered their questions
    5. what problems/flaws did they see in their original research design and how are they improving on these this week for their final week of observation?

## Wrap-up/Closure ---20 minutes

- Each group will be asked to create a 3-column chart of things they “did well” with their design, “not so well”, and what they “changed to improve” their design. They will share this with the class.
- Each group will also be given one sentence strip to write down one critical thing they learned about good research design when doing science---something important to consider when thinking about investigating a science question.

**Life in a Square – Week #6**  
**“How has our square changed?”**

Learning Objectives:

- Forming reasonable and logical arguments/explanations about how the Square has changed over the past 6 weeks, and to best communicate these explanations to others.
- Continuing to develop an understanding about the difference between observation and inference.
- Learning how to interpret the evidence so that predictions and explanations are made based on the patterns of the evidence.
- Continue developing skills to evaluate evidence and its usefulness.

Materials

**Introduction: None**

**Lesson:**

**Engage:** \_\_\_\_\_

**Explore:** new packet of seeds, clipboards, large Ziploc bag of tools/instruments, camera (PSTs responsible for this), list of other requested materials from last week for new investigation

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**Explain:** computers for Google Docs, \_\_\_\_\_

**Elaborate:** computers for Google Docs, \_\_\_\_\_

**Summative Assessment/Evaluation:** \_\_\_\_\_

**Closing Wrap-up: tape for hanging posters**

\*\* This whole lesson will take approximately 2 ½ hours.\*\*

**Introduction** - no whole class introduction this week. Go right into the lesson plan.

**Lesson --- You need to plan for 2 hours (including a 15 minute break)**

**Since this is our last week we have some things to wrap –up and a couple of extra events.**

**Here is a schedule:**

- First – go outside to collect data for the final week---be sure to clean up your square too...leave no trace of you and the kids having ever been there.
- Second – come back inside to complete you final journal entry for Week #6
- Third – snack/break
- Fourth – prepare posters for group presentations---this is the learning objective for this week.
- Fifth – complete presentations and hand out T-shirts and certificates
- Sixth – post your group’s poster out in the hallway.

**Therefore your group needs to plan your instruction for parts one, two, and four above.**

## Engage

- What did you do last week?
- Did your predictions going into last week happen? What evidence did you find to come to that conclusion?
- What new investigation did you plan last week?
- Why did this investigation change from the week before?
- What predictions did you make for this week? What evidence did you base those predictions on?
- Do you think your predictions are correct? Why or why not?
- What data/evidence do we need to look for this week to see if your predictions happened?

## Explore. *Going outside – collecting data.*

- Collect data/evidence that pertains to their investigation?
- Draw final pictures.
- Write down final, general observations.
- Did your prediction occur? How do you know this?
- Clean up square!!!

## COME BACK INSIDE

## Explain. (GoogleDocs) *Telling the story – interpreting the data formulating the explanations.*

- What did our evidence tell us? (Ask about specific evidence).
- What changes in your investigation helped you to better understand what happened in your square? Was this a productive change?
- Why is it important to carefully plan the set-up and design of the investigation before actually doing it? Does examining past investigations help to plan future investigations?
- How do you think scientists plan investigations? Do you think real scientists change their investigations ever?

## SNACK/BREAK

## Elaborate. (GoogleDocs) *Application of what was learned about the investigation question and assessing the quality of their research design.*

- Objective: Create the posters
- Include:
  - The last investigation question.
  - Prediction(s)
  - Evidence that supports or rejects the prediction.
  - A detailed and labeled picture of our square.
  - Changes you would have made to your investigation.



**Evaluate.**

- Formative----this will be embedded throughout with questioning and other short check-in assessment techniques.

**Wrap-up/Closure**

- Summative----presentation of the posters. I'd like to see each student participate in the presentation in some way, so think about how the oral presentation can be split up. You will have about 5 minutes per group to present your poster.
- Distribution of the T-shirts and certificates will be done at the end by you.