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| **Learning Set 1: How can we describe Monique’s diabetes** |

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| |  | | --- | | **Unit Driving Question:**  What controls my health?  **Sub-Driving Question:**  How can we describe Monique’s diabetes? | | |  | | --- | | **Materials List**   * Computer - one per pair of students * Projector - one for the class * Large “whiteboard” - to be used as Driving Question Board * Sub-driving question [cards](#j7vws9m85pl7) * Sticky notes * Markers * My Diabetes Modeling Chart [Student Version](#modelworksheet) (not filled in) - [Teacher’s version](#teachermodelworksheet) (filled in) |   **Video links**   * Monique 1:   <https://youtu.be/Qa-fGEJtqgM?si=gzTFadwwMO9T2PJC>   * Joe's video:   <https://youtu.be/sktC0-w6ct8?si=MMu_iAtvSm5_6hlr>   * Misty’s video:   <https://youtu.be/eKHjlaCB3Rg?si=tsTJUsddit_sjgrL>   * Other optional videos from My Type2: <https://drive.google.com/drive/folders/1yAroyEK78C83BDY9t__LtOV1zJzkIVGn?usp=sharing>   **Teacher resource- not for students.**   * **Phenomenon and Modeling: PPT Slides found in LS1 resource folder** | |  | | --- | | **Suggested lesson time**  3 days | |

**Prepare**

* [Print/cut Sub-driving question cards](#j7vws9m85pl7)

**Student materials:**

* Web resource: Meet Monique (Video Monique 1)

<https://youtu.be/Qa-fGEJtqgM?si=gzTFadwwMO9T2PJC>

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| **Framing the Learning Set** |

**Purpose**

The first learning set introduces the driving question of this unit: “What controls my health?” This driving question will be examined throughout the unit, through the case of Monique, a teenager experiencing Type 2 diabetes. The sub-driving questions of this unit will specifically address Monique and her diabetes and will be generalized to “our health” in later learning sets. By figuring out Monique’s diabetes and generalizing it to “our health”, students gain a deeper understanding of the Disciplinary Core Idea (DCI): Growth and development of organisms. The purpose of the first learning set is to engage students in the driving question of the unit by generating questions and making an initial model about diabetes.

**Learning Set Learning Goals (For instructional use)**

* The students generate questions about the causes and effects of Monique’s diabetes.
* The students construct models to begin explaining the causes and effects of Monique’s diabetes.

Color code: Scientific Practice, Crosscutting Concept, Disciplinary Core Idea

**Building Coherence- Storyline**

In this learning set, students generate questions and models regarding Monique’s health. Throughout the unit, they will revisit their generated questions and models and expand and refine them as they explore how gene-environment interaction affects people’s health.

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| **Overview of the Learning Set** |

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| **Instructional sequence overview** | **What students figure out (DCI)** | **Days** |
| **Lesson 1 - Introducing Monique - Generating the Driving Question Board**  The students watch videos of a young girl, Monique, and other young people who have Type 2 diabetes. Based on the information from the videos, students generate their own questions about Monique’s health and share them with the class. These questions will be organized and posted on a classroom Driving Question Board (DQB), a visual reference for the entire unit. | The growth of an animal is controlled by genetic factors, food intake, and interactions with other organisms.  (LS1. B. Growth and Development of Organisms) | **1.5 days** |
| **Lesson 2 - Modeling - How can we explain a phenomenon?**  The students begin to generate a working model of diabetes. The goal of this lesson is to introduce the students to the practice of scientific modeling. | **1.5 days** |
| **Optional Extension Activity- Social Determinants of Health**- students begin to think about individual as well as societal determinants of health that might be affecting Monique’s diabetes. |  | **½ day** |

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| **NGSS Connection to Assessment** |

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| **Target Performance Expectations**  [**MS-LS1-5**](http://nextgenscience.org/pe/ms-ls1-5-molecules-organisms-structures-and-processes)**.** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. |
| **Learning Performance for Learning Set 1 to be Assessed**  Students develop and use models to explain how genetic and environmental factors influence the growth and health/development of organisms.   |  |  |  | | --- | --- | --- | | **Disciplinary core idea** | **Science and engineering practices** | **Crosscutting concepts** | | **LS1.B Growth and Development of Organisms**  The growth of an animal is controlled by genetic factors, food intake, and interactions with other organisms, and each species has a typical adult size range (MS-LS-1 and Framework page 146. ). | **Developing and using models:** Develop and/or use a model to predict and/or describe phenomena. | **Cause and effect :** Cause and effect relationships may be used to predict phenomena in natural systems. | |
| **How these elements are integrated and embedded in this learning set**  As an introductory learning set, the class works together to establish a learning environment for the subsequent learning sets where students will be asking questions and developing and using models to explain the phenomenon of diabetes. The learning set starts with watching a video of a girl their age who has Type 2 diabetes. Students generate questions about the causes and effects of her diabetes based on the video. Then, they develop an initial model to explain the phenomenon, why she has diabetes. |

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| **Connection to Students’ Lives** |

**Link to Out-of-School Activity and Everyday Life**

* Create a safe environment in the classroom for students to bring their personal experience.
* Some students may have family members who experience diabetes. Explain to students that what they learn in this unit can help them understand some diseases they have encountered in their everyday life.
* Encourage students to include their family in their learning when at home. For example, students can ask their parents if any of their family members have diabetes, what their parents understand about diabetes, and what choices family members make related to their own health.

**Link to Career-Awareness** **in Science and STEM**

* The Driving Question Board is similar to a diagnosis chart used in health-related careers. Make the connection that doctors, for example, ask questions, collect data, and discuss ideas about diagnosis and plan the care with their patients and the health care team.
* Other careers related to diabetes include nurses, nutritionists, fitness coaches, health educators, lab technicians, phlebotomists.

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| **Instructional Sequence** |

**Introducing the Learning Set**

**Drawing from prior knowledge** - Start the learning set with an introductory conversation; ask questions that encourage students to think about diabetes and share their related experience, such as:

* What do you know about chronic diseases (on-going health issues) such as: diabetes, asthma, high blood pressure?
* Do you know anyone who has any of these diseases?
* Who do you think gets diabetes?
* What’s your experience with any of them?
* How might diabetes or any other health issue such as high blood pressure or asthma affect your quality of life?
* Why do some of us have diabetes, high blood pressure, or asthma while others don’t?

Let students know that all these chronic health issues have many things in common. We will focus on diabetes, but by understanding diabetes, we will be able to understand other health issues such as asthma or high blood pressure. All these diseases have things in common that we will be learning about in this unit by taking a close look at one young person who has diabetes.

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| **Lesson 1 - Introducing Monique - Generating the Driving Question Board** |

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| **Learning Goal** | The students generate questions about diabetes. |
| **Connection to NGSS** | DCI: LS1.B: Growth and Development of Organisms |
| Practice: Asking questions |
| CCC: Patterns |

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| idea.png | The purpose of the lesson is to engage the students in the driving question **“What controls my health?”** and to start thinking about aspects of one’s lifestyle that are related to one’s health. This Driving Question will be answered through the case of Monique, a young girl with diabetes.  At this point, students are **NOT** expected to come up with correct answers**.** What is important is to encourage them to share their knowledgeabou**t diabetes**, accept all related answers, and tell them they will return to this information later in the curriculum. |

* **Introduce Monique:**  Show the students the video about Monique again, a girl who is experiencing Type 2 diabetes. Ask the students: What do you notice or what did Monique talk about? Monique Video 1 2:44 minutes
* **Let’s brainstorm:** Together with the whole class, help students generate questions about Monique’s health. Point out to students that scientists ask questions. LOTS of questions. That is how they do their work. Use the *Brainstorming* strategy (see description in box below) to demonstrate to students some ways to generate questions. Provide several examples.

Do you know what brainstorming means?

X- No wrong answers...

Y...

Z...

* **Introduce categories.** Guide students to generate the anchors (see page 197) that are located at the end of this learning set. Make sure to help students think about how each anchor can be connected to Monique’s health. To start, help students generate categories that students might ask questions about, such as:
  + Family
  + Hobbies
  + Friends
  + Feelings
  + Diabetes
  + (Other student generated ideas)

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| creativity.png | **Scaffolding students using *learning strategies***   1. **What are learning strategies:** Explain what learning strategies are and emphasize the importance of learning strategies for effective learning. These are ways that students use to learn or accomplish something to become independent learners. 2. **Explain what *Brainstorming* is and how it can be used:** Brainstorming is a strategy for generating ideas. It includes generating a list of spontaneous ideas which are associated with a specific topic. For effective brainstorming: (a) focus on quantity; (b) withhold criticism; (c) welcome unusual and wild ideas; and (d) combine and improve ideas. 3. **Scaffold Brainstorming**: Together with the entire class, use the *brainstorming* strategy to generate as many questions as possible regarding Monique’s diabetes:    1. **Generating “anchors”:** Tell students to imagine Monique in their minds in as many aspects of her life as they can (Ex. her home, her family, her friends, her looks, her characteristics, her emotions, her favorite food, her hobbies, et.) After generating these aspects of Monique’s life, write them on the board. In the next step you will guide the students to use these as “anchors” to generate questions (such as those below) that connect them to Monique’s health.    2. **Generating questions\***:       1. **Family (as an anchor):** Can family affect her getting diabetes? Does Monique’s mother/father have diabetes? Does Monique’s brother/sister have diabetes? Does Monique’s grandmother/grandfather have diabetes? Did she get diabetes from someone in her family? How did her family react when they heard she had diabetes? Who has helped Monique with her diabetes? How did they help her?       2. **Friends** **(as an anchor):** Do Monique’s friends know that she has diabetes? Did Monique talk to her friends about her health? What did her friends do when they heard about her health? Do any of Monique’s friends have diabetes?       3. **Hobbies(as an anchor*)*:** What does Monique like to do? Does Monique engage in team sports? Does Monique exercise on her own (e.g., walk to school, ride her bike, etc.)? Can sports or exercise reduce the risk of getting diabetes? Does Monique like engaging in sports? Does Monique like to exercise?       4. **Feelings (as an anchor):** How did Monique feel about having diabetes? Has she wanted to make a change to her health?       5. **Diabetes (as an anchor):** What causes diabetes? What are the effects of diabetes? Can you infect another person with diabetes? Is what Monique eats related to her diabetes? How many kinds of diabetes are there? Can Monique get rid of her diabetes?   ***\** This is not an exhaustive list** |

1. **Scaffold Asking Questions.** Tell the students that they will watch the video again, this time thinking about the questions that they are **interested** in knowing about Monique’s health based on the categories (more are welcome).

Together with the class, scaffold students as they ask questions **related** to Monique and her health. Let’s brainstorm two examples before we see the video again:

* + 1. Why was Monique the only one in her family with diabetes? Monique said “...” My question is “…” This question falls under the Anchor - Family.
    2. How many types of diabetes are there? Monique said she has type II. My question is… This question falls under the Anchor - Diabetes.

Give students a moment to finish their questions individually.

In elbow partners: Share their individual lists then create one list, writing down as many questions as possible (minimum of five). Together, choose **2** questions (one favorite question per student). Each question should be written on a sticky note with their name on it. (Emphasizeon**l**y **ONE** question per sticky note).

The teacher can walk around the class to support students in coming up with and categorizing the questions according to the anchors generated in the whole class discussion. The teacher can help students change observation statements into questions.

1. **Watch Video of Other Young People with Diabetes**

Watch the videos

* + 1. Joe’s video:

<https://youtu.be/sktC0-w6ct8?si=MMu_iAtvSm5_6hlr>

* + 1. Misty’s video :

<https://youtu.be/eKHjlaCB3Rg?si=tsTJUsddit_sjgrL>

Discuss:

* + 1. What did you notice? How were Joe and Misty’ stories similar or different from Monique’s?
    2. Are there any other questions you would like to add to the DQB that Joe’s and Misty’s video brought up for you?
       1. Take a moment to let students talk in pairs.
       2. Add any new questions to the board under the categories

Do these three videos (Monique, Joe, and Misty’s’) make you think differently about who gets diabetes? Why or why not?

Addressing issue of **equity** - Conclude with ideas about diversity and not prejudging. By gathering more evidence, we can learn more about who gets diabetes. The case of Monique represents just one person’s experience with diabetes. As we have seen in the video, many different kinds of people can get diabetes. At first, we might have concluded that only girls or young black people get diabetes. It’s important that we don’t stereotype or prejudge and be sure to gather more information and perspectives before drawing conclusions.

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| **Note to teachers:** It’s important to provide students with multiple examples that show how diabetes affects many different types of people. There is a danger in genetics instruction of sending messages connecting race to genetics and health. This can increase racial prejudice and also doesn’t communicate the true risk for disease for everyone (see Donovan, 2014). |

1. **Expose the Driving Question Board (DQB) - What controls my health?** (see description in box below).

**What -** This is a DQB with the main question that we will answer throughout the unit “What controls my health?”

**Why -** The DQB helps us keep track of our wonderful questions that we will try to address throughout this unit. Our questions will guide our learning.

**How -** Based on students’ questions and observations about the videos, help students group the questions according to themes.

* + 1. The suggested themes that students will likely come up with are below in the first column. Once the questions are grouped, help students come up with one BIG question that covers those grouped questions. These will become the sub-driving questions.
    2. Post the sub-driving questions they have created around the classroom.
    3. Let them know that the list they made can be revised, more questions added, moved or deleted. If they come up with a question, they add it to DQB at any time.

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| Picture1.png | **Note for teachers:** Suggested BIG questions can be found below in the second column (wording may vary). Students may not have to come up with all the categories on their own. If this is the case, teachers are encouraged to use talk moves to help lead the conversation to those sub-driving questions if desired. For example, if students are really noticing Monique talking about her walking and exercise, perhaps asking the students questions about what Monique did to feel better might prompt those ideas and questions. From there, teachers could lead students to ask questions about exercise and environment which leads students to create the sub-driving question about how the environment might affect Monique’s diabetes. Another example, if students do not come up with a category about heredity but they bring up family, that is fine, put the questions about family as the hereditary theme. Students may ask about heredity at the end of Learning Set 2 after they talk about the biology of diabetes when they have figured out some of the biology around diabetes. Remind students that the DQ board will be revisited at the end of each learning set and likely the category will be raised at that time, before proceeding to the next learning set. |

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| Observation/ideas/questions students generated | Suggested BIG Themes and Questions to investigate in the unit |
| Why was she sad or depressed?  How did walking help her feel better?  Why did she move in with her grandmother? | *How can we describe Monique’s diabetes?* |
| Why was she hungry all the time? Does diabetes make you hungry? What are her symptoms?  How do you know you have diabetes?  How was she diagnosed? | ***Our Body****- How does diabetes affect Monique’s body systems?* |
| Why is Monique the only one in her family to have diabetes?  Is diabetes contagious?  How do you get diabetes?  Can you get rid of diabetes?  What happened to her parents? | ***Traits****- How does Monique’s family affect her diabetes?* |
| How does food affect diabetes? How does exercise affect diabetes?  Why did she move to her grandmother's house?  How did moving help her? | ***Environment-*** *How does where Monique lives and what she does affect her diabetes?* |
| Why is Monique the only one in her family to have diabetes?  Is diabetes contagious?  How do you get diabetes?  Can you get rid of diabetes?  What happened to her parents?  How does food affect diabetes? How does exercise affect diabetes? | ***Genetics and Environment-*** *How do Monique’s characteristics and where she lives affect her diabetes?* |

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| creativity.png | **Scaffolding students using *learning strategies***   1. **What are learning strategies:** Explain what learning strategies are and emphasize the importance of learning strategies for effective learning. These are ways that students use to learn or accomplish something and become independent learners. 2. **Explain what *a Driving Question Board******(DQB)*** ***is and how it can be used:*** A Driving Question Board (DQB) is a visual reference used to develop students’ understanding of the overarching driving question. It is a dynamic tool, which will organize learning and change over time as the students progress through the lessons.   **Note to teacher:** The DQB can also be a virtual reference instead of a physical presence in the classroom. Several applications, for example Jamboard, Padlet, and EdPuzzle, can be used to serve this same purpose for online and face-to-face learning. |

1. **Small group discussion -** Kids continue to add questions to the Sub-Driving Questions (SDQ)

With the student generated BIG themes/questions, have elbow partners walk together around the class with at least two other questions on sticky notes. Encourage them to place their sticky notes with one question per sticky at the SDQs that most represent the anchor(s)/BIG themes/questions for their own questions.

Have them look at the other questions placed at the SDQs and talk in the other groups to verify the questions belong together and discuss their reasoning (they will share their reasoning with the whole class).

1. **Large group discussion** - Bring them back together in their groups for a whole class discussion.

Read their questions at each SDQ.

Talk about their reasoning for placing their questions. Does the class agree?

Are there questions that don’t seem to fit easily in the SDQB categories? These can be placed in the “Parking Lot” for consideration later.

Once there is some agreement about the SDQs, move them to the DQB with the stickies.

1. **Emphasize student driven learning -** To close, reiterate the purpose of the DQB

Important questions posed by all.

Throughout the unit we will be revisiting the DQB where you will see that many of these questions will be addressed and have the opportunity to pose new questions as they arise.

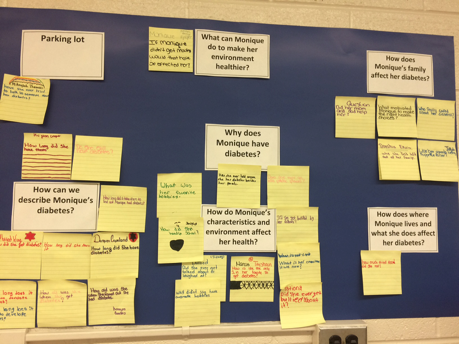
Let them know that the list they made can be revised, more questions added, moved or deleted. If they come up with a question, they add it to DQB at any time.

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| idea.png | **Note for teachers:** At this point in the discussion students are not expected to be able to draw a clear relationship, however raising this discussion is important to set the stage for the generalization that will take place in Learning Set 6. While there are racial disparities, meaning some racial groups do have higher rates of diabetes, in general this is not due to genetics, but to environmental factors, such as different access to healthy foods and safe exercise, health insurance and health care. These ideas of “social determinants of health” can be raised again with students throughout the unit. Also, it’s important to consider not only individual actions, but changes that can be made at every level that can help control Monique’s (our) health. Later, students will consider policy changes in school, community, or society that can help control our health.  [Social Determinants of Health Infographic](#socialdeterminantsofhealth)  [Conclusion and Action Items](#conclusionandactionitems) |

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| idea.png | **Making connections to medical careers and health-related issues**  Point out to students that people who work in the medical field ask patients many questions as they collect information for diagnosis and treatment. This will give students a purpose/motivation for generating questions. |

**The DQB with Sub-Driving Questions and students’ questions:**

(Go to page 19 to print out each question)



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| **Lesson 2 - Modeling - How can we describe Monique’s diabetes** |

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| **Learning Goal** | The students construct models to begin explaining the causes and effects of Monique’s diabetes. |
| **Connection to NGSS** | DCI: LS1.B: Growth and Development of Organisms |
| Practice: Developing a model |
| CCC: Cause and effect |

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| Picture1.png | The modeling practice in this lesson has two goals:   1. Support the students’ understanding of models and the scientific practice of modeling. 2. Begin generating an initial model of Monique’s diabetes.   Throughout this exercise, the teacher will introduce the **Modeling Cycle** and its constituent steps. The **Modeling Cycle graphic** supports teachers to guide students through the process of modeling. The phenomenon for this exercise is: *Monique’s Diabetes.* The question is “What controls my health?*”* In science, models are used to help **explain and understand** phenomena. Phenomena are recurring, measurable events we can experience in everyday life. Models can also be used to**make predictions** about phenomena. By observing how the model represents the phenomenon and then comparing it to the actual behavior of the phenomenon, the model can be **revised** to more accurately reflect the phenomenon. |

**Introduce** **Models and Modeling.**

**Developing models for the Unit -** In this lesson, students develop their first model that will focus on the sub-driving question of this learning set: **What affects Monique’s diabetes?**

1. Based on their experience in this learning set, together, complete the My Diabetes Modeling Chart [Student Version](#modelworksheet) (not filled in) - [Teacher’s version](#teachermodelworksheet) (filled in) **REFLECT** upon learning together
   1. **Identify the sub-driving question -** What is the sub-driving question that students were asked to think about during the Learning Set?
   2. **Identify the questions** - What questions did students pose at the beginning of the Learning Set?
   3. **Identify the Main Message (**Whole group discussion) - **What** did students figure out from the Learning Set? Use the following prompts:
      1. What do you think are the take-home messages from the learning set?
      2. What did you learn in this learning set?
   4. **PLAN as a whole group/class.** 
      1. **Identify the big ideas of this learning set. Under components, together, list things like** walking, eating, family, etc. that Monique or the other kids mentioned in the videos that affect diabetes.
   5. **BUILD in small groups:** Discuss that these Big Ideas are called components. Have students used their big ideas to draw their model of What affects Monique’s diabetes?
      1. It’s ok if students draw a girl with the various big ideas/components, this is an initial model.
      2. **Help students connect the components (demonstrate to the class before students go into small groups)** - Connect the components in a **causal relationship** *from* the cause *to* the effect.
   6. **SHARE as a whole group/class -** Collectively, share the models with the class such as through a gallery walk. Use the questions above, e.g one per small group, to have students present to the large group. When sharing models, discuss with the students:
      1. The similarities and differences between the models
      2. The models’ strengths and weaknesses
      3. Ways to improve the various models
2. **REVISE together** - Based on feedback and observing other models, discuss, together, how the students might revise their models. Once they finish, they can document (e.g take a picture of) their group’s model and send it to their teacher. These models can be used for formative assessment, and for students’ to examine and reflect upon their model development process at the end of the unit.

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| discussion.jpg | A discussion which shares insights from the various models and compares among them is extremely important as it will scaffold the students’ second revision of their models in the following step. Use questions to prompt the students to critically examine their peers’ models.  **Components:**   * **Components identity**- What components are included in each model? Are key components included? * **Number of components** - How many components are indicated in the model? Are MORE components necessarily better? * **Grouping of components** - How can we group the various components? Why should we group components - does it improve our models? Is the grouping meaningful?   **Relationships among components:**   * **Explicit relationships among the components** - Are the relationships among the components indicated? Do these relationships make sense? Are the indicated relationships important?   **General features:**   * **Complexity of the model** *-* How complex is the model? * **Organization**- How well is the model organized? Is the organization meaningful? |

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| **Wrapping up a Learning Set 1: Revisiting the DQB** |

1. Ask students to review the questions and consider if any have been answered? Does their model raise any new questions that we should add to the SDQs?
2. Refer to some of their questions around the sub-driving question, “What affects Monique’s diabetes?” to make the transition to Learning Set 2 (Students are **NOT** expected to come up with correct answers). For example:
   1. Does your model explain how our body works to control diabetes?
   2. Does your model explain what diabetes does to one’s body?
   3. **How is diabetes diagnosed?**
3. Explain that we will address this SDQ and their questions next.

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| **Family Engagement** |

Engaging with families is an important component of Health in Our Hands to increase relevance, bring family knowledge and experience to class, and support cognitive and social-emotional learning. Newsletter templates are available that can be sent home before the unit starts and before each learning set to communicate with family members.

For Learning Set 1., in the section titled, “Connection to Students’ Lives,” students are encouraged to include their family members in their learning when at home. Questions such as those below would be interesting to discuss with family members. Encourage students to review the DQB for questions they could discuss at home. These could include:

1. Do any of our family members have diabetes?
2. What does our family know about diabetes?
3. What choices can we as a family make related to our own health?
4. If someone in the family has diabetes, what does this mean for the rest of the family? Does diabetes run in families?

This information can be shared in the next science class, and provide a coherent transition onto the next lesson

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| **Optional Extension Activity - Social Determinants of Health** |

**Introduce ideas about social determinants of health:**

* Show or distribute this infographic for discussion:
  + How can Monique’s diabetes help us understand “What Controls My Health?” Let’s look at this infographic called “[social determinants of health](#socialdeterminantsofhealth)”
* Think/Pair/Share:
  + What do you notice?
  + What does it make you think about?
  + What do you wonder?
* Discuss individual actions vs. community/society actions:
  + Is Monique the only one who controls her health?
  + How can actions by her family, friends, school, community and the overall society affect her health**?**

**Sub-driving Questions Cards**

**How can we describe Monique’s diabetes?**

**Our Body**

How does diabetes affect Monique’s body systems?

**Traits**

How does Monique’s family affect her diabetes?

**Environment**

How does where Monique lives and what she does affect her diabetes?

**Traits and Environment**

How do Monique’s characteristics and environment affect her health?

**Parking lot**



**Action**

What can Monique do to make her environment healthier?

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| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Components** |
| **1.** |  |  |  |
| **Model 1** | | | |
| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Components** |
| **2** |  |  |  |
| **Model 2** | | | |

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| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Components** |
| **3** |  |  |  |
| **Model 3** | | | |

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| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Components** |
| **4** |  |  |  |
| **Model 4** | | | |

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| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Components** |
| **5** |  |  |  |
| **Model 5** | | | |

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| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Components** |
| **6.** |  |  |  |
| **Model 6** | | | |

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| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Big Ideas/Components**  **(Bolded are key components)** |
| **1. *What affects Monique’s diabetes?*** | *Why does Monique have diabetes?*  *What can cause diabetes?*  *Why does someone have diabetes while others do not?*  *What affects people getting diabetes?*  *Are there different kinds of diabetes?* | **Phenomenon**- Monique’s diabetes  **We figured out-** that there are factors that affect some people (like Monique) getting/developing diabetes. | * **Diabetes** * **Activities**/behaviors/things that affect diabetes : Food, Exercise, Family, etc. * **Feelings**: being sad or depressed, feeling better (once she loses weight and starts exercising) * **Family** |

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| **Exemplar Model - *What affects Monique’s diabetes?***  A diagram of a person  Description automatically generated | | | |
| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Components**  **(Bolded are key components)** |
| ***2. How does diabetes affect Monique’s body systems?*** | *What can cause diabetes?*  *What affects diabetes?*  *What are the consequences of diabetes?*  *What happens in one’s body when a person has diabetes?*  *Are there different types of diabetes? How do people treat diabetes?* | **Phenomenon:** The biological mechanism of diabetes.  **We figured out:** The biological mechanism of diabetes. For example, when people have diabetes, blood glucose levels can become too high if they eat foods with a lot of sugar because glucose cannot get into your cells. The pancreas plays a big part in breaking down sugar in your blood because it produces insulin. Insulin is like a key that unlocks cells to let sugar in to be broken down to provide energy for the cells. | * **Diabetes** * **Glucose (sugar)** * **Blood glucose level** * **Pancreas** * **Insulin** * Affects other **organs**: eyes, brain, heart, kidneys, feet, and nerves. * **Symptoms**: Feeling thirsty, hungry, getting tired, and frequent urination |
| **Exemplar Model - *How does diabetes affect Monique’s body systems?***  **A diagram of a disease  Description automatically generated** | | | |

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| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Components**  **(Bolded are key components)** |
| **3. *How does Monique’s family affect her diabetes?*** | *Do you think Monique’s family might have something to do with her getting diabetes? If so, how?*  *Why do you think Monique is the only one in her family with diabetes?*  *Why does someone have while others don’t?*  *How the genes affect diabetes?* | **Phenomenon:** Genetic factors that affect your traits.  **We figure out:**  Genes are found on chromosomes and they code for proteins that affect the traits of all living things. Sometimes genes can have mutations that affect the proteins that are made and then that affect the traits a living thing has. For example, genetic factors can affect a person’s risk for diabetes. The more genetic risk factors people inherit from their parents, the higher your risk is to develop the trait of diabetes. Some genes produce specific proteins that may contribute to development of diabetes. | * **Diabetes** (atrait) * Traits (such as arm span or tongue rolling) * **Genetic risk factor** * Parent * **Variation** * **Mutation** * **Chromosome** * **Protein** * **Gene** |
| **Exemplar Model - How does Monique’s family affect her diabetes?**  **A diagram of a genetic modification  Description automatically generated** | | | |

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| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Components**  **(Bolded are key components)** |
| **4. *How do Monique’s characteristics and environment affect her diabetes?*** | *Do genes affect diabetes?*  *Do the food we eat affect diabetes?*  *Will the environment and genes also affect other organisms as well?*  *How do environmental and genetic factors impact living things over time?* | **Phenomenon:** Link between genes and environment on the health of living things.  **We figured out:** Both the environment (what we eat and how active we are) and genetic information affect the health of organisms and can contribute to an increased risk for diseases like diabetes. | * **Diabetes** * **Genetic factors** -   + Parents   + Risk factors * **Environmental factors**   + Exercise   + Healthy food   + Eating habits   + Healthy lifestyle   + Unhealthy lifestyle |
| **Exemplar Model - How do Monique’s characteristics and environment affect her diabetes?**  **A diagram of a healthier life cycle  Description automatically generated** | | | |

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| **Learning Set**  **Sub-Driving Question** | **Our Questions** | **A. What is the phenomenon we are trying to explain?**  **B. What did we figure out?** | **Components**  **(Bolded are key components)** |
| ***5. What can Monique do to make her environment healthier?*** | *Can what Monique eats can affect her diabetes?*  *What would you suggest Monique do to make her environment healthier?*  *What kind of food does she need to eat?*  *What kind of food does she need to avoid?*  *How do we get information about the food we eat?*  *How much sugar is in the food I eat?* | **Phenomenon: “**Hidden”Sugars in foods  **We figured out:** Different foods contain different amounts of sugar. Because too much sugar can lead to poor health, it is important for us to read food labels to be informed about the scale, proportion and quantity of sugar in the food we eat. | * **Diabetes** * Various type of food * **Different amount of sugar in food** |
| **Exemplar Model - What can Monique do to make her environment healthier?**  A diagram of a blood sugar intake  Description automatically generated with medium confidence | | | |

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