**Group A**

**Math**
- M1: Make sense of problems and persevere in solving them
- M2: Reason abstractly and quantitatively
- M6: Attend to precision
- M7: Look for and make use of structure
- M8: Look for and express regularity in repeated reasoning

**Science**
- S1: Ask questions and define problems
- S3: Plan and carry out investigations
- S4: Analyze and interpret data
- S5: Use mathematics, information technology, and computational thinking
- S6: Construct explanations and design solutions

**ELA**
- E1: Demonstrate independence in reading complex texts and writing and speaking about them
- E7: Come to understand other perspectives and cultures through reading, listening, and collaborating

**Students are using the observation as evidence to engage in argumentation ("the second one because the plant starts to grow roots")**

**Students trying to figure out what germination means while using their sprouted bean.**

**Students have a growing kidney bean plant to observe.**

**Create a data tables and sensors to measure water levels,**

**Students could research using scientific materials and how other plants germinate that they are interested in.**

**They could create a report/recipe on how to germinate a bean.**

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**Source:** Based on work by Tina Cheuk, [http://ell.stanford.edu/teaching_resources](http://ell.stanford.edu/teaching_resources)

**Students discuss in small groups what germinating means (e.g., "another way to say grow, sprout", change color)
Group B

Students trying to figure out what germination meant while using their sprouted bean.

Students discuss in small groups what germinating meant (e.g., "another way to say grow, sprout", change color)

Students are using the observation as evidence to engage in argumentation ("the second one because the plant starts to grow roots")

Students have a growing kidney bean plant to observe.

Use a flip book to diagram growth

Measure beans and stalk and chart growth

Illustration of progress over time to show changes.

Use spreadsheet on computer to enter data collected

Writing description of each phase as it grows

Source: Based on work by Tina Cheuk, http://ell.stanford.edu/teaching_resources

Math

M1: Make sense of problems and persevere in solving them
M2: Reason abstractly and quantitatively
M6: Attend to precision
M7: Look for and make use of structure
M8: Look for and express regularity in repeated reasoning

Science

S1: Ask questions and define problems
S2: Develop and use models
S3: Plan and carry out investigations
S4: Analyze and interpret data
S5: Use mathematics, information and computer technology, and computational thinking
S6: Construct explanations and design solutions

ELA

E1: Demonstrate independence in reading complex texts and writing and speaking about them
E2: Build a strong base of knowledge through content-rich texts
E3: Obtain, synthesize, and report findings clearly and effectively in response to task and purpose
E4: Construct viable arguments and critique the reasoning of others
E5: Read, write, and speak grade-appropriate English
E6: Use technology and digital media strategically and capably
M5: Use appropriate tools strategically

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Group C

Math

M1: Make sense of problems and persevere in solving them
M2: Reason abstractly and quantitatively
M3: Construct viable arguments and critique the reasoning of others
M4: Model with mathematics
M5: Use appropriate tools strategically
M6: Attend to precision
M7: Look for and make use of structure
M8: Look for and express regularity in repeated reasoning

Science

S1: Ask questions and define problems
S2: Develop and use models
S3: Plan and carry out investigations
S4: Analyze and interpret data
S5: Use mathematics, information technology, and computational thinking
S6: Construct explanations and design solutions
S7: Engage in argument from evidence
S8: Obtain, evaluate, and communicate information

E1: Demonstrate evidence in reading and writing about texts
E2: Build a strong base of knowledge through content-rich texts
E3: Obtain, synthesize, and articulate information
E4: Observe, infer, and make predictions
E5: Read to learn
E6: Use technology and calipers to support analysis
M3a: argue from evidence
M3b: use evidence to support an argument
M3c: evaluate evidence
M5d: create a graph that compares the growth of two kidney bean plants growing in different liquids
M6: attend to precision
M7: look for and express regularity in repeated reasoning

The students will write out any noticeable patterns. Analyze data for commonalities and differences.

Students will brainstorm/write out their hypothesis/procedure to grow their kidney plant.

Students will participate in an open discussion regarding the growth/failures of their kidney plants. What are major takeaways/things you would do differently?

Create a graph that compares the growth of two kidney bean plants growing in different liquids.

Students have a growing kidney bean plant to observe.

Students discuss in small groups what germinating means (e.g., “another way to say grow, sprout”, change color”)

Students trying to figure out what germination means while using their sprouted bean.
**Group D**

- **Math**: M1: Make sense of problems and persevere in solving them. M2: Reason abstractly and quantitatively.

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**Measure the plant as it grows.**

- **Researching using technology**: Have students research questions/topics they may have through the process with books.
- **Students discuss in small groups what germinating means (e.g., “another way to say grow, sprout”, change color”).**

**ELA**

- **E1: Demonstrate texts and e-books.**
- **E7: Comment and criticize the reasoning of others.**

**Students are using the observation as evidence to engage in argumentation (“the second one because the plant starts to grow roots”).**

**Students trying to figure out what germination meant while using their sprouted bean.**

**Students journal throughout the bean process, turn their findings into a presentation (slides, poster, comic book, etc.) and present to the class. Students respond to others presentations.**

**Drawing the diagram and labeling**
**Math**

- M1: Make sense of problems and persevere in solving them
- M2: Reason abstractly and quantitatively
- M3: Construct viable arguments and critique the reasoning of others
- M4: Model with mathematics
- M5: Use appropriate tools strategically
- M6: Attend to precision
- M7: Look for and make use of structure
- M8: Look for and express regularity in repeated reasoning

**Science**

- S1: Ask questions and define problems
- S2: Develop and use models
- S3: Use mathematics, information and computer technology, and computational thinking
- S4: Analyze and interpret data
- S5: Use mathematics, information, and computer technology, and computational thinking
- S6: Construct explanations and design solutions

**ELA**

- E1: Demonstrate independence in reading, responding to texts and writing and speaking about them
- E2: Build background knowledge by drawing on cultural, global, and interdisciplinary perspectives
- E3: Read closely to determine what the text says explicitly and to make logical inferences from it
- E4: Determine a central idea or theme and analyze its development throughout a text
- E5: Recognize and analyze similarities in the way recurring language patterns are used within and across texts
- E6: Use technology and digital media strategically and capably
- E7: Come to understand other people and cultures through reading, listening, viewing, and collaborating

**Group E**

- Compare height from week to week. Collecting data
- The teacher will ask “how” and “why” questions.

**Students**

- Students have a growing kidney bean plant to observe.
- Students are using the observation as evidence to engage in argumentation (“the second one because the plant starts to grow roots”)
- Students discuss in small groups what germination means (e.g., “another way to say grow, sprout”, change color)
- Reviewing vocabulary words; having open discussions in order to understand other people’s perspectives.
- Review the life cycle to avoid confusion
Today we ____. Tomorrow we will ____.
Students have a growing kidney bean plant to observe.

Students are using the observation as evidence to engage in argumentation (“the second one because the plant starts to grow roots”)

Students trying to figure out what germination meant while using their sprouted bean.

At the end of the experiment, do a oral report on findings

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Math

M1: Make sense of problems and persevere in solving them
M2: Reason abstractly and quantitatively
M3: Construct viable arguments and critique the reasoning of others
M4: Model with mathematics
M5: Use appropriate tools strategically
M6: Attend to precision
M7: Look for and make use of structure
M8: Look for and express regularity in repeated reasoning
M9: Use a graphic arts program to create a diagram of the lifecycle of a kidney bean

ELA

E1: Demonstrate facility in reading complex texts and writing about them
E2: Develop complex arguments and critique the reasoning of others
E3: Obtain, synthesize, and report findings clearly and effectively in response to task and purpose
E4: Construct explanations and design solutions
E5: Engage in argument from evidence
E6: Use technology and digital media strategically and appropriately
E7: Come to understand other people and cultures through reading, listening, and collaborating
E8: Obtain, evaluate, and communicate information

Students discuss in small groups what germinating means (e.g., “another way to say grow, sprout”, “change color”)

Taking measurements every day to record growth of kidney bean seeds.