Experimenting with “Ask, Test, Repeat”

The title page appears on screen. Bright, colorful shapes overlap and shift. Upbeat music plays in the background throughout the video.

Text on screen: Ontario Science Centre; An Agency of the Government of Ontario

Animated graphics swipe away to reveal a title card with playful geometric shapes.

Text on screen: Experimenting with “Ask, Test, Repeat”

Animated graphics sweep away again to reveal Shajgev. He is standing in a craft room. There is a whiteboard on an easel beside him. On the whiteboard is a drawing of a plant, showing it both above and below ground, with the sun shining in one corner and a bee flying towards the plant. On a table in front of Shajgev are colourful craft supplies.

Overlaid text on screen: Shajgev (he/him) Science Educator, Ontario Science Centre.

Shajgev: Hello, my name is Shajgev, and I am a science educator with the Ontario Science Centre.
In this, the third video of our series, our focus is on purposeful exploration using a model of Ask, Test, Repeat.

Split screen: A video of Jessica presenting Video One, and Shajgev.

Shajgev: In Video One, we talked about the power of “I wonder...” to model curiosity. Curiosity is the first step in scientific investigation and engineering design.

Split screen: A video of Taiba presenting Video Two, and Shajgev.

Shajgev: In Video Two, we touched on the power of “yet” in fostering a growth mindset that will help children persist through challenges.

Split screen: The words Ask, Test, Repeat form a circle connected by arrows, and Shajgev.

Shajgev: In this video, we’ll talk about the “Ask, Test, Repeat” cycle.
“Ask, Test, Repeat” builds on what we explored in videos one and two, embracing failure as a key stage in the scientific process. One that can provide meaningful opportunities for children to learn, grow and build resilience.

Shajgev appears full screen.

Shajgev: We will explore how the scientific inquiry process—Ask, Test, Repeat—can be embedded into everyday classroom experiences across the curriculum, encouraging children to see themselves as capable STEM thinkers.

Animated graphics swipe away to reveal a title card with playful geometric shapes.

Text on screen: Background

Animated graphics sweep away again to reveal Shajgev.

Shajgev: As a kindergarten teacher, you're asked countless questions every day. Each "why" and "how" represents a child who is actively asking to learn. When we welcome these questions, we show children that curiosity is the precursor to discovery, the first step toward meaningful learning and a growth mindset.

A diverse group of children independently make musical instruments from cardboard boxes and tubes, pipe cleaners, scissors, markers, and tape.

Shajgev: The "Ask, Test, Repeat" model is a scientific inquiry and engineering design framework that builds directly on a child's instinct to explore. It mirrors how children naturally figure things out. Instead of following a rigid set of steps, students engage in an investigative cycle that feels intuitive to them. They ask questions, try out ideas, observe what happens, and make changes based on what they've discovered. Throughout, we as educators can normalize "trying again" as a natural and expected part of the learning process.

Shajgev appears full screen.

Overlaid text on screen: Remember: Everyone has a STEM brain. We can support students in building math and science skills in our classrooms every day.

Shajgev: Teachers know that students naturally use their "math brains" and "science brains" every time they sort, compare, measure, build or problem-solve. Our role is to help them recognize that these actions are part of real-world scientific and engineering processes.

A group of children "bake" together in a play kitchen. They take pretend snacks on a tray from the toy oven; a child watches closely as her parent puts a real tray of cookies in a real oven.

Shajgev: Through this recognition, students will see themselves as capable STEM thinkers in school and beyond, as people who can explore, design, and discover.

An educator sits on the floor and speaks with three girls. One wears a chef's hat, one has a stethoscope, and one wears a construction helmet.

Shajgev: So how do we as educators bring the "Ask, Test, Repeat" framework to life in the classroom and what can it do for us? Let's take a closer look.

Animated graphics swipe away to reveal a title card with playful geometric shapes.

Text on screen: Ask

Animated graphics sweep away again to reveal Shajgev.

Shajgev: Language is a key component in scientific investigation and engineering design, framing the questions that STEM then explores. In Video One, we highlighted educators' important role in modelling curiosity by asking questions.

An educator holds up one of the children's drawings and points to a star shape. She asks a question, a child raises their hand and answers correctly, then the educator moves on to point at another shape.

Overlaid text on screen: B12.1 state problems and pose questions

Shajgev: Children need to hear adults demonstrating how to ask questions as they come to understand the "5-W's and How" and when to use which question starter.

Shajgev appears full screen.

Shajgev: Creating a chart can help children pinpoint the type of question they want to ask. Another way to make thinking visible is to create a Wonder Wall.

A child writes with a marker on a whiteboard mounted on the wall at her level. An educator leans down to appreciate the child's efforts.

Shajgev: Here, children can be invited to post drawings, words or symbols that represent their big questions.

An educator reads a story to her students seated around her in a semi-circle. When she comes to a picture of a frog, she stops, closes the book, and raises her hand. All the children raise their hands as well. The educator asks the children questions, lets each child respond, then continues reading to them.

Shajgev: Stories provide a natural entry point for practicing these questioning skills. As you share a story with your children, pause to model a range of questions about the characters, settings and events. Invite children to generate their own questions using the stems. In a storybook, for example, if a character is trying to cross a river, you might ask "How can we help this character get across the river? Let's be helpful and build something!"

Shajgev appears full screen.

Shajgev: Some questions may be asked that you do not have the answers to—these moments are important, too! You might respond with something like, "That's a great question. I'm not sure of the answer. Let's think of ways we could find out together."
As educators, it's perfectly okay to take the time to find a simple explanation, and to model this behaviour for students, too.

Animated graphics swipe away to reveal a title card with playful geometric shapes.

Text on screen: Test and Observe

Animated graphics sweep away again to reveal Shajgev.

Shajgev: Observation is at the heart of science investigation and engineering design. We can scaffold active observation by asking learners guiding questions about what their senses experience, providing science tools to assist in observation and graphic organizers for recording, and using STEM language.

Split screen: Shajgev and text.

Text on screen: Instructive Questions

Shajgev: As children play, we can ask instructive questions to draw their attention to what their senses are telling them such as:

Split screen: additional text, as spoken by Shajgev; a child assembles building blocks at a play table; an overhead view of children taking turns at stacking wooden blocks into a tall tower at a play table.

Shajgev: “How are the two things different?”
“What do you see? Does it look like anything familiar?”
“What does it feel like? Is it rough or soft?”
“What do you hear? Can you make the sound?”
When creating your learning centres, consider incorporating science tools that highlight using their senses and observational skills.

Children playfully look at each other with magnifying glasses; an educator leans in to assist children sorting colourful foam shapes.

Shajgev: Once children have made their observations, ask them to make predictions.

Overlaid text on screen: B12.2. make predictions and observations while exploring, investigating, and designing.

Shajgev: This is a great way to introduce your students to what a “hypothesis” is!
Have conversations about what a prediction is and how a prediction does not need to be correct.

A diverse group of children assemble vehicles from toy wheels and axles; children respond to their educator asking questions to them as they make tally marks on a sheet of paper.

Shajgev: For example, you can ask, “How long do you think it will take to put away all the toys you are playing with? If five friends help you instead of just one, will it take more time or less time? Why?” You can ask the children to draw out the prediction and label it with words they know.

Shajgev appears full screen.

Shajgev: You can also ask them to verbally explain their prediction and encourage them to use starter phrases such as “I think.... because”.
After they make their prediction, ask how they can test their idea before they begin building or exploring. This often means guiding them to use what they may already know—something they remember from a book, cartoon, or an experience—to come up with creative ways to test their ideas.

Overlaid text on screen: How will we know how long it takes you to put the toys away? Is there a way we could time you?

Shajgev: Now, you can ask students to test their prediction by guiding them through designing an experiment.

Overlaid text on screen: B12.3 select materials and tools to carry out investigations and to construct models and structures
B12.5 design, build, and test models and structures

Shajgev: During the prototyping, give children the autonomy and freedom to select which materials they want to use. This also gives you the opportunity to ask children why they selected certain materials, providing you with insight into their thinking processes.

Children work on the floor building bridges from blocks and construction paper. They test their bridge's strength by placing a block on top. The children try various configurations of sizes of blocks, adding extra paper, and folding the paper.

Shajgev: For example, students can be given a variety of materials to build bridges for a toy car to safely cross between two desks.

Overlaid text on screen: B12.3 select materials and tools to carry out investigations and to construct models and structures

To extend this activity, you can ask them to explore how they might build the structure again with different materials than the ones already used. Can they make it strong enough to hold many cars? How many?

Shajgev appears full screen.

Overlaid text on screen: A4.1 use knowledge of letters, words, and sentences, with pictures and symbols, to create simple texts

Shajgev: As children carry out their investigations, ask them to record their observations with charts, pictures and words.

The children continue to experiment with building their bridges, even though they sometimes fail at the load bearing test stage.

Overlaid text on screen: D19.3 express their thoughts and share experiences

Shajgev: You can pause at different points during the activity to ask them to share their observations with their classmates. Encourage the use of descriptive words like those that capture size, colour, shape, movement, speed, or weight.

Shajgev appears full screen.

Shajgev: Remember: STEM language can go beyond STEM activities. Using the correct STEM words throughout the day helps children see that curiosity and innovation belong everywhere, at any time, not just during science time.

Animated graphics swipe away to reveal a title card with playful geometric shapes.

Text on screen: Repeat and Reflect

Animated graphics sweep away again to reveal Shajgev.

Shajgev: The “Ask, Test, Repeat” framework positions trial-and-error as a natural and fundamental part of scientific investigation and engineering design—because it is!
In this process, children will experience many attempts that don’t go as planned. During moments of difficulty, you can establish a class-wide “general rule” to normalize persistence.

Overlaid text on screen: C15.3 demonstrate self-motivation, initiative, and confidence in their approach to learning
C15.4 demonstrate self-control and adapt behaviour to different contexts

Shajgev: You might say, “If you don’t get it the first time, you can try again. If you don’t get it the second time, try asking a friend. If you’re frustrated, take a break and try again later.”

A group of children play a maze game by moving different coloured sticks through slots in a piece of white cardboard to sort the sticks by colour and count them.

Shajgev: This supports children in developing emotional awareness and resilience as they engage in scientific thinking.

A group of children take turns stacking wooden blocks vertically. They stack them as high as they can reach before it slowly topples over. They gather the fallen blocks and start again.

Shajgev: It is important to remember that trial-and-error is not only expected but essential: it creates opportunities to observe, rethink, and try again, with learning happening throughout.

Children place arrows in a maze made from large building blocks on the floor, forming a path through it.

Shajgev: Failure is an opportunity to learn, but success doesn’t mean the learning is complete! Even when children successfully build a model or carry out an investigation, you can motivate additional discovery by offering extension opportunities.

The children now place arrows in a maze made of chairs instead of blocks; a child draws on paper with a marker; her educator talks to the child about her picture.

Shajgev: Encourage them to create a second version of their experiment or model by changing one variable, such as using a different material or changing the size.
Asking students to draw “before and after” sketches of their models can help kreinforce the idea that iteration is a natural part of all scientific work, too.

Shajgev appears full screen.

Overlaid text on screen: B12.4 draw conclusions and communicate results

Shajgev: Whether succeeding or failing, conversations where you ask children to compare ideas, consider alternatives, and justify their choices are a great way to build their critical thinking skills. These skills extend far beyond STEM. They reinforce students' foundations in writing, reading, oral language and social-emotional learning, too—vital skills for learning and for everyday life.

Student self-assessment opportunities should be embedded throughout the "Ask, Test, Repeat" cycle.

Split screen: Text, as spoken by Shajgev and a series of clips: An educator helps his students build birdhouses out of craft supplies while outdoors; children work together at a play table to create a drawing; an educator explains to her student a toy car she has built that has an inflated balloon attached. The car scoots across the table when the air is let out of the balloon.

Shajgev: Because this framework is iterative by design, it provides multiple moments for *assessment for learning*, *assessment as learning*, and *assessment of learning*. Review your students' drawings, hypotheses and observation logs, and have class discussions and one-on-one conversations to understand their progress.

Shajgev appears full screen.

Shajgev: These sources of formative assessment create natural checkpoints for you to monitor a student's understanding, reflection, and progress.
Throughout your activities, find moments to celebrate the work and the process, not just the outcomes. When a child tries something new, takes a risk or persists through a challenge, those are all accomplishments worthy of recognition along the way.

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Text on screen: Routines

Animated graphics sweep away again to reveal Shajgev.

Shajgev: Routines are the backbone of kindergarten classrooms.

Split screen: Text, as spoken by Shajgev; and a series of clips: Two children work together using wooden parts, glue sticks, tape, wooden skewers and construction paper to build a toy car with a sail; a child plays with toy vehicles; children work together to put away their toys; a child blows onto the sail of the car they created to race across the playroom floor.

Shajgev: They give children repeated opportunities and methods to work together, engage in problem solving, use social skills, actively participate, build self-confidence, develop a sense of

identity, practice self-regulation and be aware of their surroundings. When routines are co-constructed with children, these skills develop even deeper roots because children understand why the routine exists and feel ownership over it.

Shajgev appears full screen.

Shajgev: One way to use “Ask, Test, Repeat” when co-constructing routines is to start with a practical question that invites children to observe their surroundings or solve a problem such as “How can we get ready for recess as quickly as possible?”

Split screen: Shajgev, and text, as spoken by Shajgev.

Shajgev: These questions provide the chance for students to suggest steps, test their ideas, reflect on what worked and what didn’t, then repeat to look for improvements by changing one thing at a time.

Shajgev appears full screen.

Overlaid text on screen: B11.1 use directional and positional language to create and follow instructions involving movement
B11.2 test and refine instructions
B11.3 communicate and record step-by-step instructions using symbols, words, or pictures

Shajgev: Throughout this process, you can also introduce directional and positional language such as “First... second...next” to help children sequence their thinking and communicate their ideas clearly. Over time, this familiar language can even become a classroom management tool.

Animated graphics swipe away to reveal a title card with playful geometric shapes.

Text on screen: Conclusion

Animated graphics sweep away again to reveal Shajgev.

Shajgev: The kindergarten classroom is a place that is naturally full of curiosity, wonder, and discovery. Everything that children do in your classroom can be tied to scientific investigation and engineering design.
As an educator, you create and nurture these opportunities for children to explore, question and make sense of their world. By embracing the “Ask, Test, Repeat” framework, you help students see STEM beyond science time and help them see themselves as STEM capable in and out of the classroom.

Animated graphics sweep away to reveal text.

Text on screen: We hope you enjoyed this video, which is part of a series developed to support Ontario’s kindergarten teachers in STEM education.

Be sure to check out other videos in this series along with additional classroom-ready resources and professional learning resources at OntarioScienceCentre.ca.

Animated graphics sweep away to reveal text.

Text on screen: Ontario Science Centre; An Agency of the Government of Ontario