



# SOLE

How to Bring Self-Organized  
Learning Environments to  
Your Community

By Sugata Mitra  
**TED**Prize Winner

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# How to Bring Self-Organized Learning Environments to Your Community.

## 01 INTRODUCTION

# WELCOME

Welcome to the Self-Organized Learning Environment (SOLE) Toolkit, an online resource designed to help educators and parents support kids (8-12 years old) as they tap into their innate sense of wonder and engage in child-driven learning.

### CHILD-DRIVEN LEARNING IS

- ✓ Self-organized
- ✓ Curious
- ✓ Engaged
- ✓ Social
- ✓ Collaborative
- ✓ Motivated by peer-interest
- ✓ Fueled by adult encouragement and admiration

Educators of all kinds (parents, teachers, community leaders, etc) play an important role in both teaching kids how to think, and giving them room to feed their curiosity. The SOLE approach embraces a process where kids learn how to ask questions that make them come alive to the world, questions like the following,

What is a soul? Can animals think? How does my digestion system work?

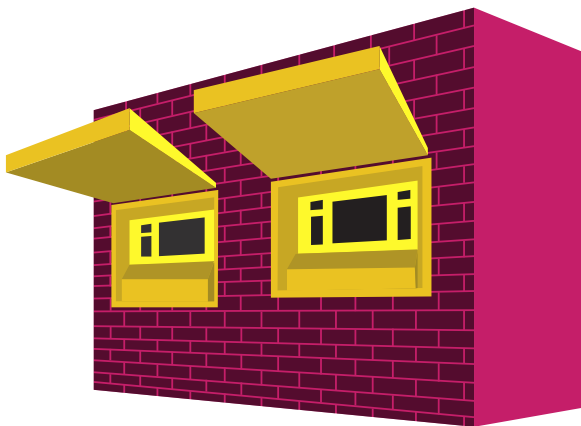


# Did dinosaurs really exist?

—Curiosity Catalyst

*To prepare for the realities of the future workplace and the rapidly changing technological landscape, it is critical for educators to invite kids to get good at asking big questions that lead them on intellectual journeys to pursue answers, rather than only memorizing facts.*

After a series of experiments revealed that groups of children can learn almost anything by themselves, researcher Sugata Mitra began his pursuit to inspire children all over the world to get curious and work together. In 1999, Sugata and his colleagues dug a hole in a wall bordering a slum in New Delhi, installed an Internet-connected PC, and left it there (with a hidden camera). Soon, they saw kids from the slum playing with the computer, learning English and searching through a wide variety of websites on science and other topics, and then teaching each other.



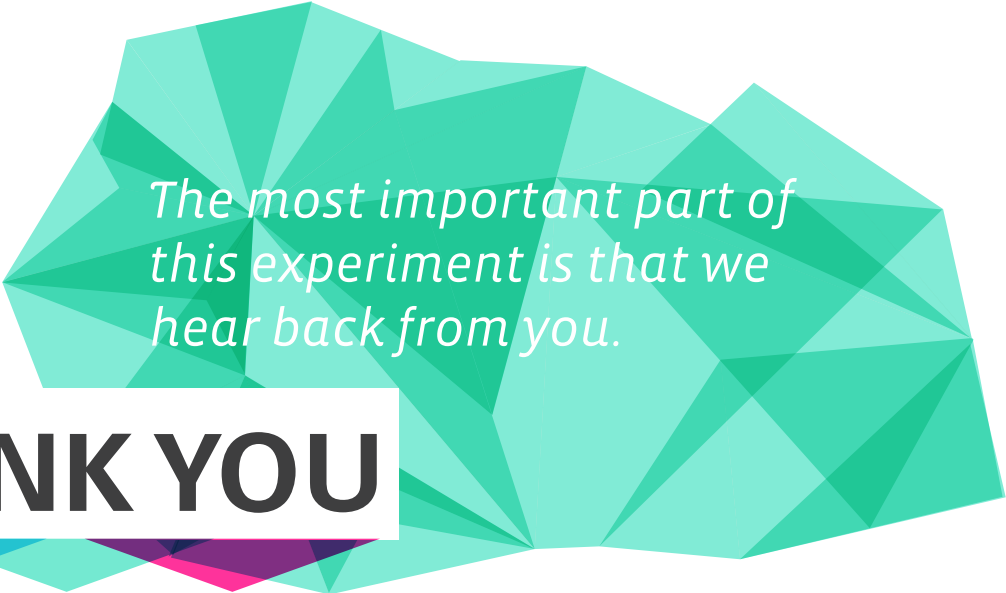
▶▶ *Hole in the Wall experiment in New Delhi slum.*





Sugata and his colleagues carried out experiments for over 13 years on the nature of self-organized learning, its extent, how it works and the role of adults in encouraging it. His innovative and bold efforts towards advancing learning for children all over the world earned him the first-ever \$1 million dollar **TED** Prize award. At the 2013 **TED** conference, Sugata asked the global **TED** community to make his dream a reality by helping him build the ultimate **School in the Cloud** where children, no matter how rich or poor, can engage and connect with information and mentoring online.

In addition to revealing his plan to create a virtual school that offers a child-driven learning experience, he invited thinkers and doers worldwide to create their own miniature self-organized learning environments (**SOLEs**) and share their discoveries.



*The most important part of  
this experiment is that we  
hear back from you.*

**THANK YOU**

Thank you for responding to Sugata's call to action by investing your time and creativity to improve how kids learn in your community. This toolkit is here to guide you as you embark on an adventure where kids direct their own learning with a curriculum of big questions, dynamic interactions, and boundless possibilities.

We look forward to hearing what happens on your Self-Organized Learning Environment (**SOLE**) adventures. Share your stories and feedback here:  
[www.ted.com/solefeedback](http://www.ted.com/solefeedback)

“Who knows what we’ll need to learn thirty years from now? We do know that we will need to be good at searching for information, collating it, and figuring out whether it is right or wrong.”



—Sugata Mitra

### What’s a SOLE?

**SOLE** | *noun.* [sohl] **Self-Organized Learning Environment**



Self-Organized Learning Environments (SOLEs) are created when educators and/or parents encourage kids to work as a community to answer their own vibrant questions by using the internet.

#### HERE ARE THE BASIC PARAMETERS



Children between 8 and 12 years old choose their own groups of four and their own questions to explore



Children can look to see what other groups are doing and take that information back to their own group



Kids can move around freely



Kids can change groups at any time



Children can talk with each other and discuss with other groups



Participants have the opportunity to tell their friends what they learned after the SOLE

The SOLE learning path is fueled by big, kid-created questions, self-discovery, sharing, and spontaneity.



## Why set up a SOLE?



Here is just a partial list of the many ways that Sugata’s and others’ studies have shown that people like you can benefit from SOLEs:



### EDUCATORS & PARENTS

- ✓ Get better at asking questions
- ✓ Become more in tune with what children are most interested in
- ✓ Feel connected on a more equal level, instead of hierarchically
- ✓ Expand their understanding of what kids can learn on their own
- ✓ Have **FUN!**



### CHILDREN AT SCHOOL OR AT HOME

- ✓ Take ownership of their learning experience
- ✓ Improve reading comprehension, literacy, behavior, language, creativity, and problem-solving abilities
- ✓ Develop habits to become a lifelong learner
- ✓ Develop stronger memory recall
- ✓ Strengthen interpersonal skills
- ✓ Get better at integrating what they already know into classroom discussions
- ✓ Develop a more trusting relationship with educators and adults, generally
- ✓ Increase motivation to learn about more subjects and ideas
- ✓ Have **FUN!**



Was the color “orange” named after the fruit or vice versa?

—Curiosity Catalyst



### HOME

- ✓ Opportunity to actively participate in your child’s learning
- ✓ Cultivate a culture of curiosity in the home
- ✓ Reinforce and expand on what your kids have already learned in school
- ✓ Strengthen connections between parents and kids
- ✓ And of course—have **FUN!**



### SCHOOLS OR AFTER-SCHOOL PROGRAMS

- ✓ Encourage children to learn independent thinking and learning skills earlier
- ✓ Create cultures of curiosity and child-driven learning
- ✓ Experience more invigorated and interested classrooms
- ✓ Offer more opportunities for both independent thinking and collaboration
- ✓ Create more intergenerational admiration and understanding
- ✓ And you guessed it—have more **FUN!**

*“Education-as-usual assumes that kids are empty vessels who need to be sat down in a room and filled with curricular content. Dr. Mitra’s experiments prove that wrong.”*

 —Linux Journal

## The SOLE Mindset



To make the most out of the experience, adopt the **SOLE** mindset:

### CHILD-DRIVEN



Kids are motivated by choice and the interests they share with their friends. Self-directed learning is more sustainable, long-lasting learning.

### COLLABORATIVE



Kids learn socially before internalizing knowledge. Learning with a crew also helps with memory recall and the development of social skills.

### CURIOUS



All kids are born with an innate sense of wonder. Kids construct their own understanding of new concepts by relating it to what they already know.

### OPEN-MINDED



Kids are capable of understanding more than adults usually give them credit for, especially when they’re in a flexible environment where it is okay to experiment, “unlearn” beliefs and assumptions when necessary, and make mistakes.

### TRANSFORMATIVE



Children have the ability to think critically and can learn astonishingly quickly.

### ENCOURAGING



The most effective educators are great witnesses, supporters, and structure-providers, but not answer-suppliers. The Internet helps children answer almost any question, but encouragement helps kids have the confidence to be resilient and solve problems.

### PATIENT



It may take some time for educators to become comfortable with a new technique and for children to adapt to a new way of learning. If at first you don’t succeed, try and try again.

### SOLES FEED THE FIRE OF CURIOSITY

- ✓ Kids are in charge of finding answers
- ✓ A peer helper is responsible for behavior management
- ✓ Children are free to organize groups on their own
- ✓ Kids perceive greater control of their own learning



“Children will learn to do what they want to do.”



—Sugata Mitra

# 02 ORGANIZE

How to set up a SOLE

## BUILD YOUR SOLE:



Now, it is time to create your own SOLE space! Here's what you need:

### SIMPLE SOLE ESSENTIALS: AT SCHOOL



▶ **1 computer** per 4 kids  
(Hint: A large screen helps the whole group get a better view)



▶ A **whiteboard** or **blackboard** to write questions on



▶ **Paper** and **pens** for kids to take notes for their sharing at the end of the SOLE



▶ For younger kids, a **nametag** or something fun to designate the helper's role.

### SIMPLE SOLE ESSENTIALS: AT HOME



▶ **1 laptop** or **desktop** per group of 4 children



▶ **Paper** and **pens** for kids to take notes for their sharing at the end of the SOLE



▶ **Optional:** Webcam, microphone, and creative software packages for graphics, video, music and communication



PLAN YOUR SOLE:

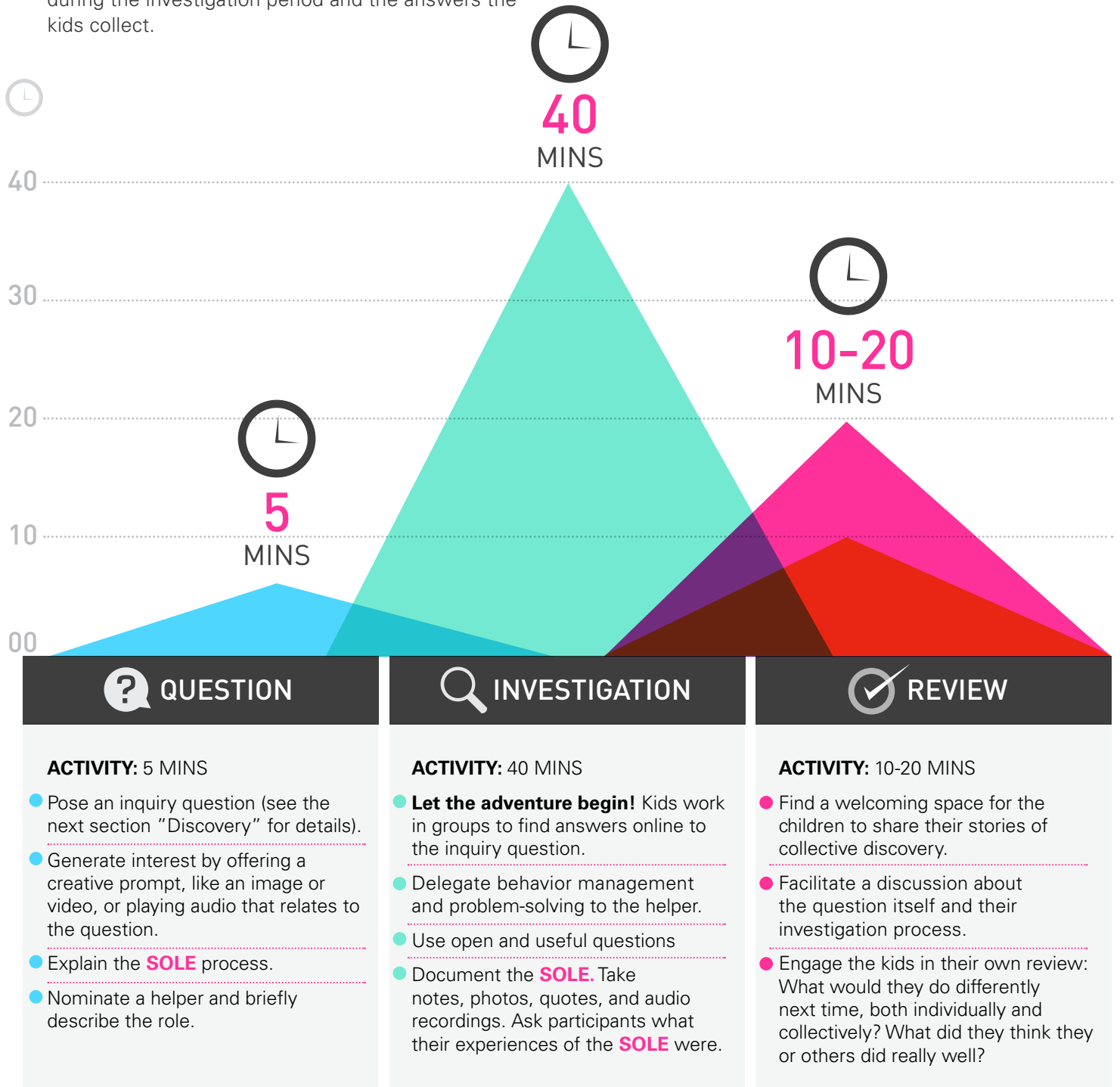


Once you design your SOLE space, it's time to plan your first SOLE. Here is a sample SOLE plan that can be adjusted to fit your schedule, space, and community realities.

The time required for review and feedback may vary depending on the complexity of the question posed during the investigation period and the answers the kids collect.



—Curiosity Catalyst



“Ask **BIG** questions,  
find **BIG** answers.”

03

## DISCOVER

*What makes a good question?*



—Sugata Mitra

The magic sparked by the **SOLE** experience emerges from fascinating questions igniting children’s curiosity. When launching a **SOLE**, it is important for educators to model a spirit of wonder to set the tone. By demonstrating their own inquisitiveness when introducing queries for kids to explore, adult facilitators will create an open, flexible, and encouraging space for children to take intellectual risks.

We have found that large, open, difficult and interesting questions often make the best “big” questions for **SOLE** inquiries. Questions that are unanswerable; such as “who made space?” help encourage kids to offer theories instead of concrete answers. *Even though it may be tempting to ask questions with seemingly easy answers, it is important to ask big picture questions that promote deeper and longer conversations.*



For example, here are some sample “**big**” questions a group of fifth graders investigated:



? What was ancient Egypt really like?



? How do my eyes know to cry when I’m sad?



? Why do people slip on wet surfaces?



? Did dinosaurs really exist?



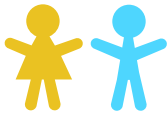
Here are more **big** questions you can ask:



? Can you kill a goat by staring at it?



? Why aren’t there any mammals bigger than a blue whale?



? Do boys think differently from girls?



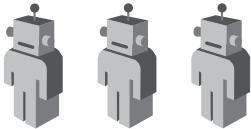
? What are the five best tips for better searching on Google?



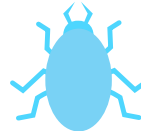
? Can anything be less than zero?



? Do fish feel pain?



? Will robots be conscious one day?



? Is it disgusting to eat insects?



? Is it more dangerous to fly in an airplane or to drive?



? Why haven't we seen evidence of intelligent alien life? (Fermi's question: where are they?)



? Are there more stars in the universe or grains of sand on all the world's beaches?



? Was the color "orange" named after the fruit or vice versa?



? What is irony?



? Is there life on other planets?



? Why do things fall down and not up or sideways?



? What is altruism?



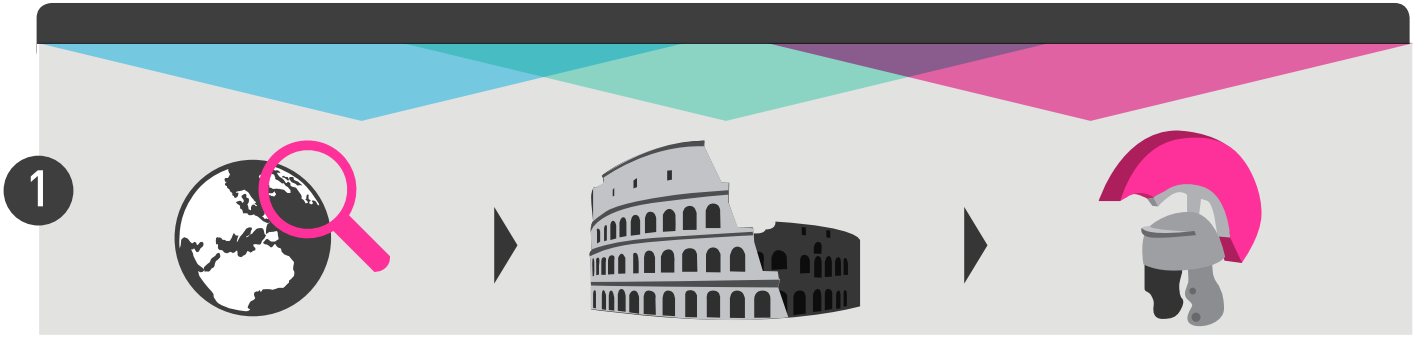
## MORE QUESTIONS

**WATCH IT:** View a SOLE question demonstration in this video:  
[www.bitly.com/soledemo](http://www.bitly.com/soledemo)





Next, here are some examples of how to frame and build up to a question in a discussion with 8-12 year olds:

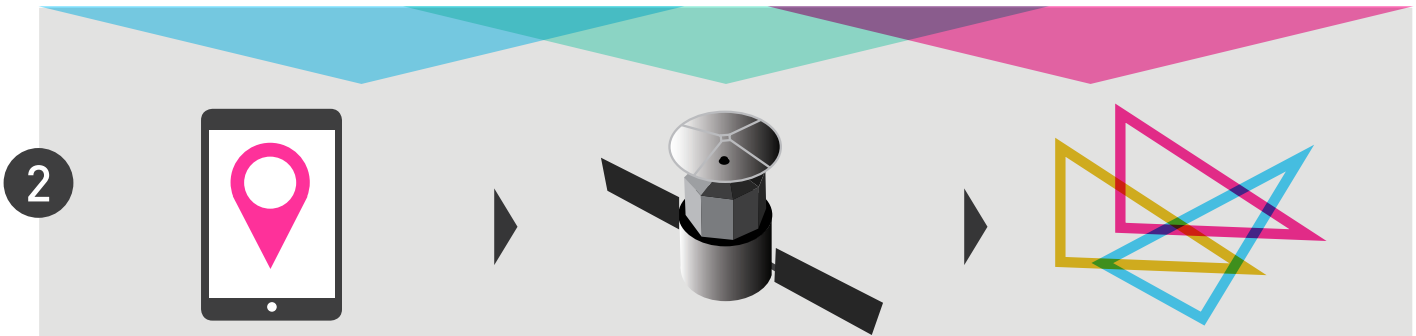


**SAY:** "I was playing with Google Maps today and I want to show you something."

**NEXT:** Zoom in on Italy on Google Maps, and then on Rome, and finally end up at the Colosseum.

**ASK:** "What's that big round building and why is it broken?"

**RESULT:** The SOLE should lead to children learning about the Roman Empire and its demise.



**SAY:** "Are you awake and full of energy today? I have a really hard but important question for you."

**ASK:** How does an iPad know where it is? You ask for my location, and it tells you. How does it do that?"

**RESULT:** Their SOLE explorations will eventually take you to GPS, satellites, and finally trigonometry.



**SAY:** "You know what, I don't really feel like standing here and talking all afternoon. But I have a puzzle for you to solve, if you can."

**ASK:** "Can you guess what is common between rubies, sapphires, and airplanes?"

**RESULT:** The SOLE journey will lead the children to the answer: aluminum. After the kids arrive at that result, it is a perfect set-up for an additional discussion about how else aluminum is used in the world.



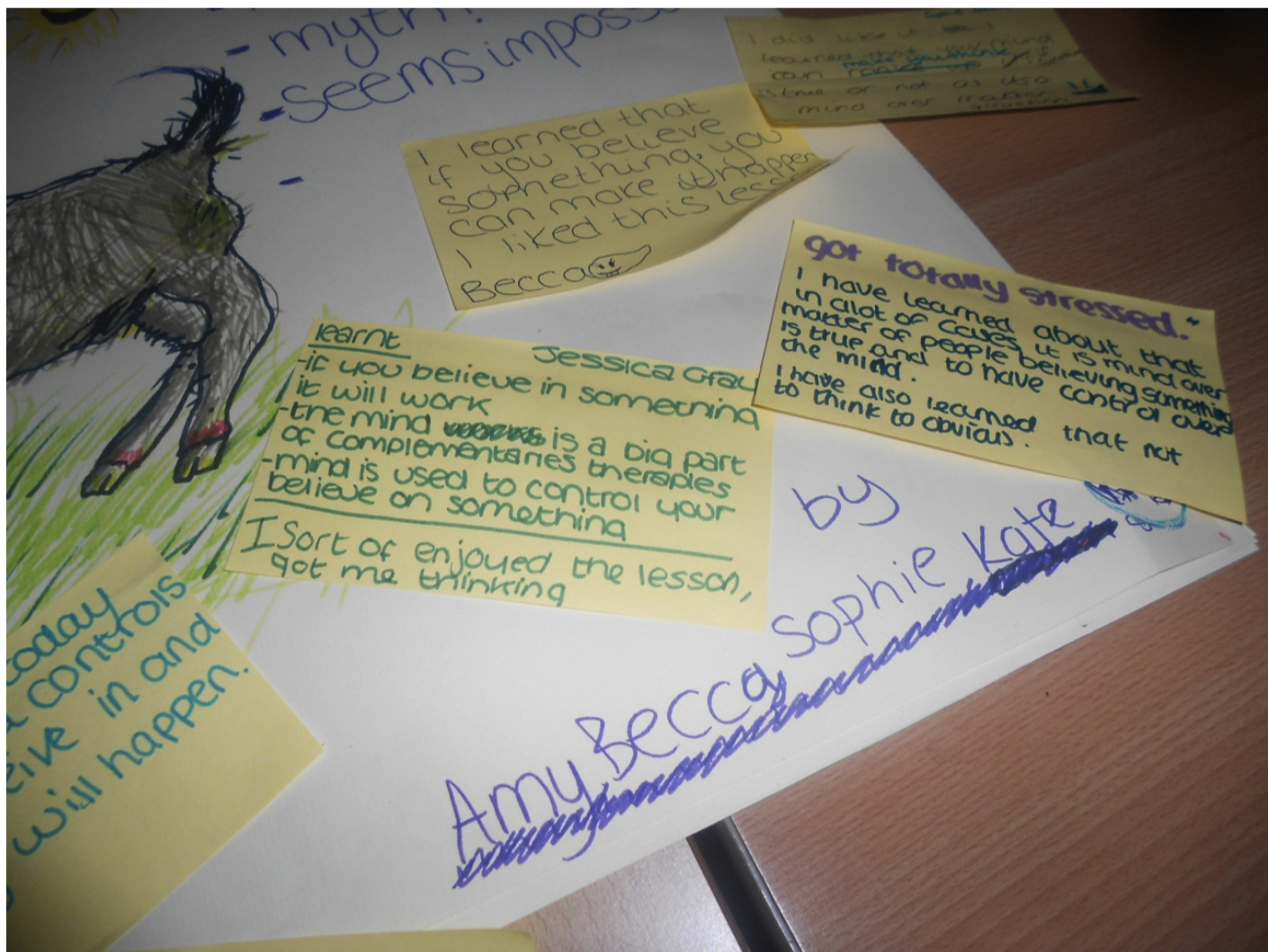
EXAMPLE OF CHILDREN'S WORK



▶▶ Photo by: Amy Dickinson, Newcastle, UK



### EXAMPLE OF CHILDREN'S WORK



▶▶ Photo by: Amy Dickinson, Newcastle, UK



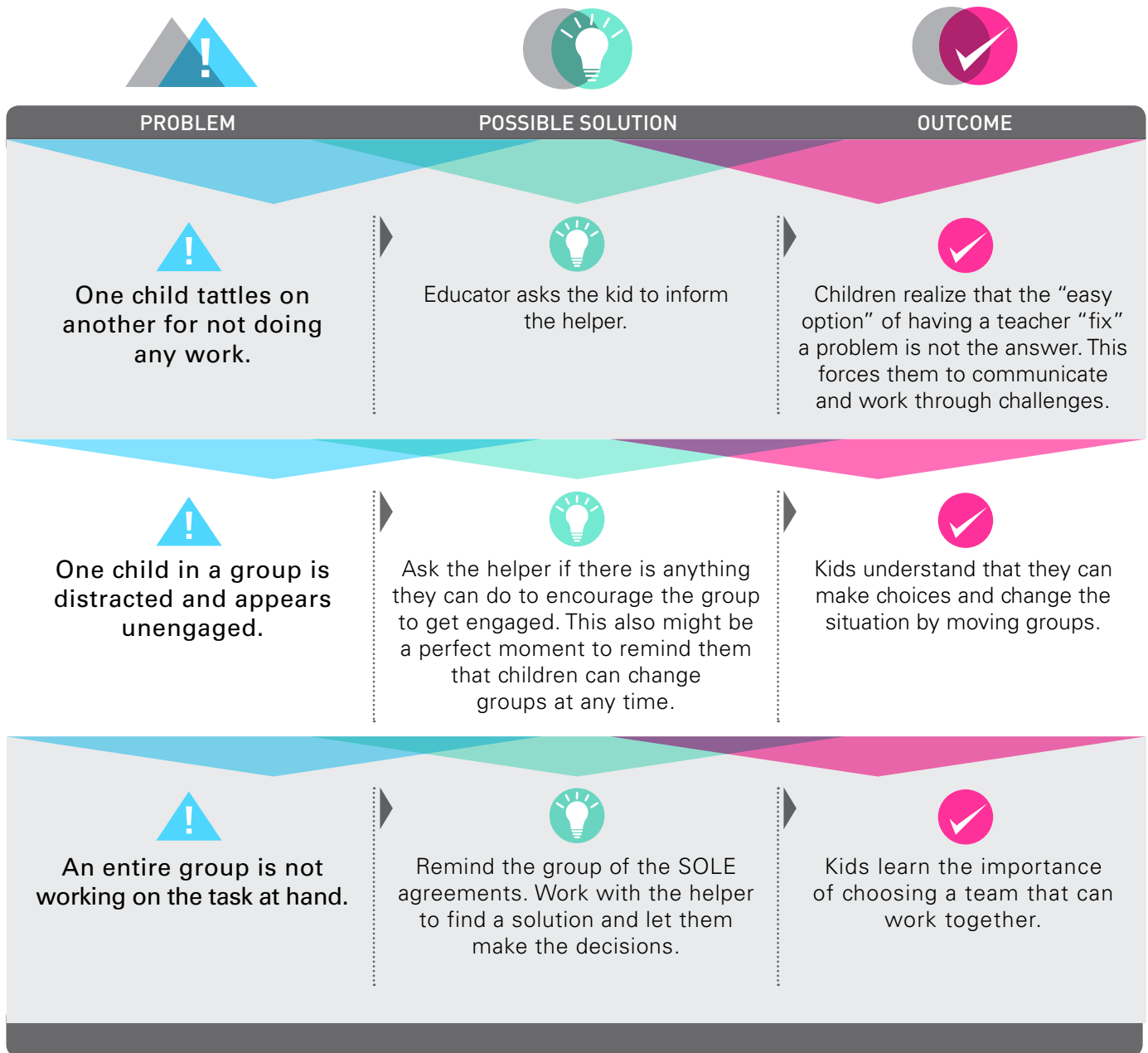
# Is there life on other planets?

—Curiosity Catalyst

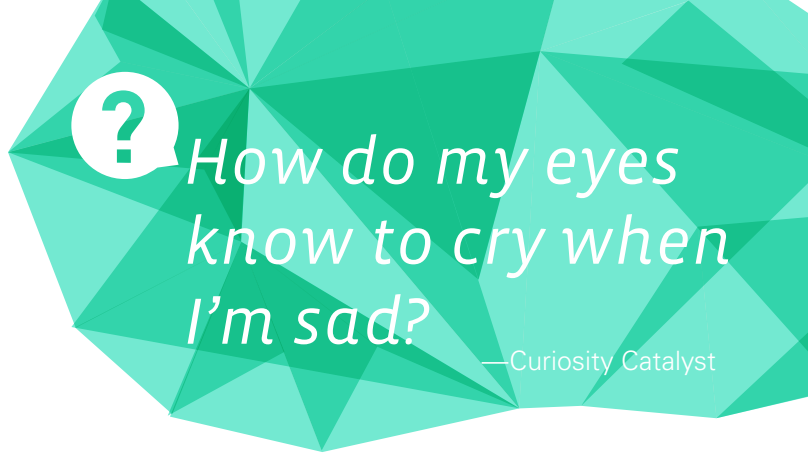
## 04 SOLUTIONS Tips for handling challenges



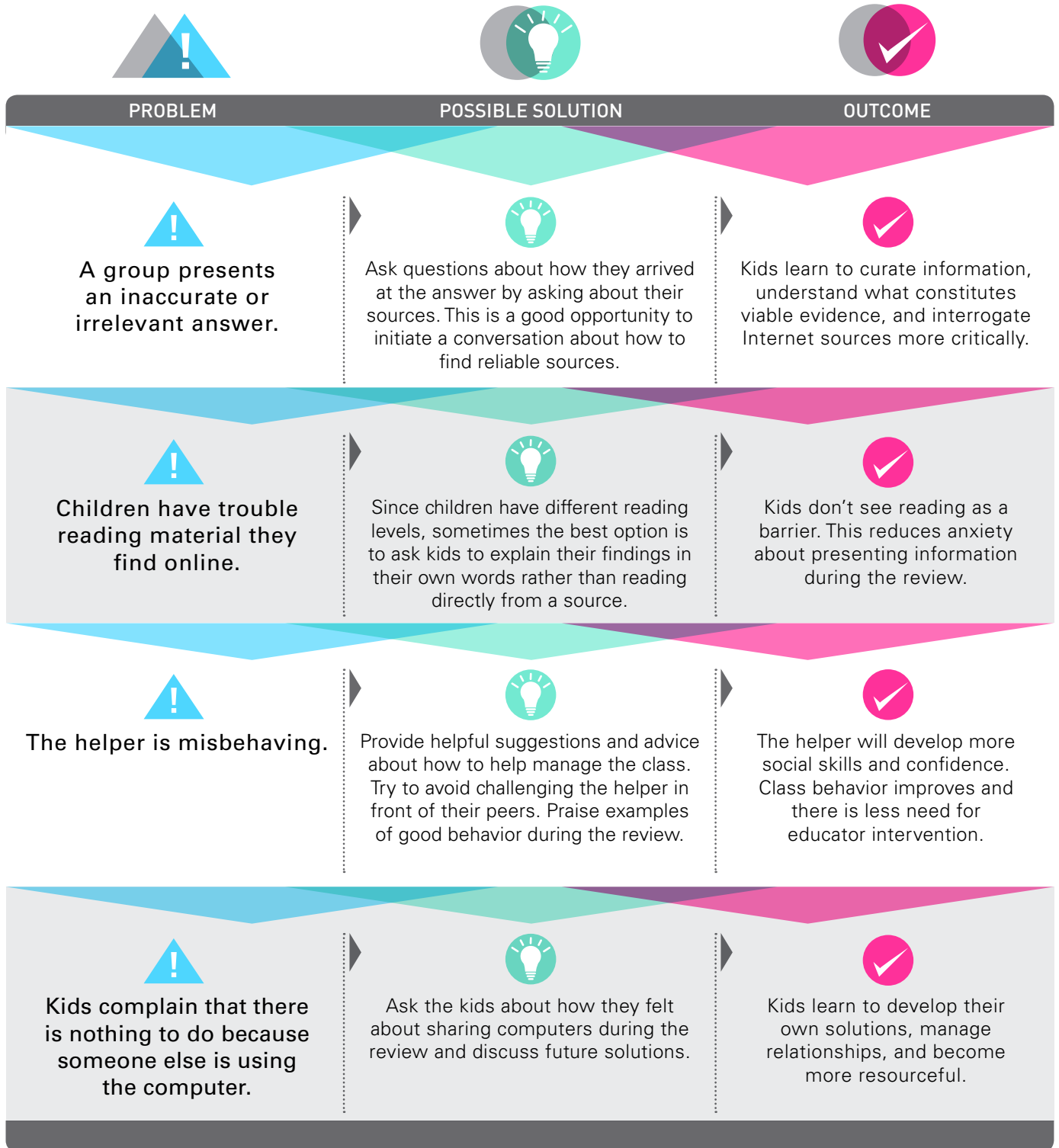
While every SOLE experience is unique, here are some common situations you might encounter.







*How do my eyes know to cry when I'm sad?*  
—Curiosity Catalyst



SOLE is a global laboratory. Share your feedback and help us reinvent how kids learn.

05

TELL US!

*Share your stories*

## SUBMIT YOUR FEEDBACK

**Submit** your feedback here: [www.ted.com/solefeedback](http://www.ted.com/solefeedback)  
Your voice matters. Share stories your SOLE adventures with us.



### EMAIL

**Write us:** [solesupport@ted.com](mailto:solesupport@ted.com)



### SURVEY

**Fill out this quick survey:** [www.ted.com/solefeedback](http://www.ted.com/solefeedback)



### CONVERSATION

**Join our TED conversation:** Share your ideas by telling us: What is the most important thing you've learned on your own?

[www.ted.com/sugataconversation](http://www.ted.com/sugataconversation)



### TWEET

Tweet at us at [@TEDPrize](https://twitter.com/TEDPrize) and share your SOLE stories using this hashtag: [#TEDSOLE](https://twitter.com/TEDSOLE)



## 06 RESOURCES

# VIDEOS



Sugata Mitra's TED Talks

<http://bitly.com/SugataTalks>

GOOD "Future Learning" Video

<http://bit.ly/Goodsugata>

## 07 INSPIRATIONS

*SOLE Stories*



# Hyderabad, India | 2002

Sugata Mitra gave a computer to a group of children in Hyderabad, India with a speech to text interface. Due to their strong accents, the computer wrote gibberish when they spoke. When the kids informed Sugata about the computer's inability to comprehend their accents, he encouraged them to figure out how to make themselves understood to the computer and traveled back to England.

Two months later, their accents transformed, and the entire group of children had the same neutral British accent as the computer because of their own self-teaching.





# Kalikuppam, India | 2007

Sugata Mitra launched an experiment in Kalikuppam with a really challenging question: “Can Tamil speaking 12 year old children in a south Indian village, teach themselves biotechnology of DNA replication in English by themselves from a streetside computer?”

After leaving the children with the computer for two months, the children confessed that they didn’t understand anything. At first, Sugata wasn’t surprised about their inability to find the answer because of the difficulty of the subject matter until a young girl elaborated: “Apart from the fact that the improper replication of the DNA molecule causes genetic disease, we’ve understood nothing else.”

It was then that he realized that if the experience he witnessed in Kalikuppam could happen, kids anywhere can learn just about anything on their own.





# Turin, Italy | 2009

Sugata Mitra traveled to a school in Turin, Italy, where the kids couldn't speak English. Not being able to speak Italian himself, he wrote on the board in English: "How did the dinosaurs die?" Within twenty minutes, the kids translated the sentence and answered the question in both languages.

Next, in English, he asked, "Who is Pythagoras and what did he do?" This question proved a little trickier for the ten-year-olds, but in a few minutes, right-angled triangles began to appear on the screen, bringing shivers to Sugata's spine as he was informed that he spelled Pythagoras wrong and the kids spelled the philosopher and mathematician's name for Sugata in Italian.



# ACKNOWLEDGEMENTS

## Research

This toolkit was adapted from Sugata Mitra, Paul Dolan, David Leat, Emma Crawley, and Suneeta Kulkarni's *The Self Organised Learning Environment (SOLE) Support Pack* published in 2010.

## Editors

Jamia Wilson, TED Prize Storyteller  
John Cary, TED Prize Strategist  
Courtney Martin, TED Prize Strategist

## Design

Megan Jett  
[www.meganjett.com](http://www.meganjett.com)

And thank you to thousands of children around the world.



*Help us reinvent the way kids learn.*



[www.ted.com/sugata](http://www.ted.com/sugata)





“My wish is to help design the future of learning by supporting children all over the world to tap into their innate sense of wonder and work together. Help me build the School in the Cloud, a learning lab in India, where children can embark on intellectual adventures by engaging and connecting with information and mentoring online. I also invite you, wherever you are, to create your own miniature child-driven learning environments and share your discoveries.”



—Sugata Mitra