SCSA &
SCSA (Schools)

A TEACHER'S PLAYBOOK:

SCSA IN YOUR SCHOOL

Version: 2020

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Welcome!

About SCSA (Schools)

The SCSA (Schools) is organised by teachers for their own schools as a prelude to the SCSA national competition. Through SCSA (Schools), outstanding toys can be selected to enter the SCSA competition, which takes place from May – November

Students learning to use new tools at the SCSA Technical Workshop.

Why?

SCSA (Schools) offers an opportunity to all the kids in your school to experience the satisfaction of turning their imagination into reality. During the process, students get the chance to be engaged in collaborative work and build their confidence, determination and perseverance. SCSA (Schools) can also be integrated with existing programme frameworks, such as the Applied Learning Programme (ALP) and Project Work (PW). Over 50 schools in Singapore hold the SCSA (Schools) yearly.

> **"SCSA has the ability to translate complex ideas into something that young children find simple and easy to comprehend. SCSA has made science learning fun and enjoyable."**
>
> ***Mr Jegendren Tanapal***
> ***Yew Tee Primary School***
> ***Diamond Award Recipient***

SCSA prepares our students for the future through developing their **21st century competencies**:

- Critical and Inventive Thinking
- Communication, Collaboration and Information Skills
- Decision-Making
- Self-Directed Learning
- Confidence

Check out what other schools organised for 2016's SCSA (Schools) at this link: goo.gl/PkABbp

Mr Jegendren Tanapal
Yew Tee Primary School
Diamond Award Recipient

"The process of guiding the students and learning from senior teachers have also helped me grow as an educator, providing me an opportunity to introduce science concepts to students that are beyond the school's syllabus."

For Schools & Teachers

Friends of SCSA Award

Schools which have organised the SCSA (Schools) for three consecutive years are eligible to receive the "Friends of SCSA" Award. The award is an acknowledgement of the school's continuous effort and support through organising the SCSA (Schools) competition.

Blue Ribbon Award

Teachers who have played pivotal roles in motivating and mentoring students for this competition will be recognised through the Blue Ribbon Award.

Diamond Award

Teachers with outstanding track records of making a positive impact on the students through this competition will be recognised with the Diamond Award. To qualify for this award, teachers are required to win at least two SCSA Blue Ribbon Awards prior and be involved in SCSA for at least 3 years. To nominate teachers for either the Blue Ribbon or Diamond Award, simply complete the nomination form. Please contact upstream@science.edu.sg for more information on the nomination form. Diamond Award applicants are required to attend a compulsory scheduled sharing/discussion session with the Working Committee.

"I have enjoyed encouraging my students to learn more about science through SCSA. SCSA provides planned activities that are interactive and stimulates pupils' thinking."

Ms Yong Hui Wen
Yishun Primary School
Diamond Award Recipient

SCSA Timeline

EVENT	DESCRIPTION
TEACHERS' BRIEFING ***(E-BRIEFING AS OF 2020)*** FEBRUARY	During the e-briefing session, teachers will be provided with detailed information about SCSA (Schools) competition and SCSA national competition, look at examples of past year's winning toys and understand more about the judging criteria of the toys.
WORKSHOPS ***(ONLINE RESOURCES AS OF 2020)*** FEBRUARY	The online resources made available to all schools can be shared with teachers and participating students. o Students' Design Thinking Workshop o *For Teachers:* Workshop on How to Prepare Your Students – Suggestions and Ideas.
REGISTRATION BY MAY	Register your school by submitting **Form A** to the SCSA organisers by **29 May**. (Online registration)
SUBMIT FORM B BY JULY	**Report on Progress of SCSA (Schools) Competition** Using the Form B provided by organisers by the **first week of July.** (Online submission)
TOY SUBMISSION 6-8 JULY	All toys are to be submitted to the SCSA organisers on these dates. Each toy must be labelled (with SCSA sticker labels provided) and packed securely with the completed entry form.
FINAL JUDGING INTERVIEWS 26 AUGUST	Shortlisted students (WhizKid only) will be informed via the school and will go through a round of workshop challenge and interview with the SCSA judges.
AWARD CEREMONY & TOY EXHIBITION NOVEMBER	The winners will each receive an award at the Awards Ceremony. Students will be able to view all the winning and shortlisted toys at the exhibition after the ceremony.

Note: Timeline is subject to changes. Please take note of the periodic updates sent throughout the period of the competition.

Planning for SCSA (Schools)

So how do you go about organising a SCSA (Schools) competition in your own school? Here we provide you with some tips and points for consideration when planning a SCSA (Schools) Competition.

Decide Who's Participating

It could be a small-scale competition involving just one class or a CCA club, to start off as a pilot programme. A pool of thirty students is all you need. It could be a level-wide competition or one involving the entire school for a large scale one.

Curriculum Integration

SCSA (Schools) encourages independent learning, creative problem-solving, as well as collaborative work as students get to work in pairs and sometimes families. Many of the teams that take part consist of students from different academic levels. It is wise to integrate SCSA (Schools) with existing programme frameworks, such as the Applied Learning Program (ALP) and Project Work (PW). Otherwise, it is also a good activity for Science teachers to incorporate into their lessons.

> **"Over the years, we have seen our students demonstrate self-directed and collaborative learning as they explore and work on applying science concepts into their toys, while at the same time, teachers from different subjects such as English, Mathematics and Art have helped to impart different skills that assist in the toy development."**
>
> ***Mdm Cheong Oi Koan***
> ***Compassvale Primary School***
> ***Diamond Award Recipient***

Manpower

For large-scale format, fellow teachers from different disciplines could be roped in to help out. The parent network is often able to provide excellent help and support for the logistical portion of the competition, such as with toy carnivals or showcases, as well as toy submissions.

Call for Entries

To get students interested in this project, you may hold an assembly talk to introduce students to the competition and explain the rationale, as well as show some good examples of past years' winning toys. Letters to parents can be disseminated, to inform families about this project and encourage them to provide guidance and support to the kids.

> **What we are really looking for is how students can think out of the box. That forms the very basis for STEM education and the start for our future scientists and engineers.**
>
> ***Dr Chew Soon Hoe***
> ***Assistant Professor, NUS***
> ***SCSA 2018-2019 Working Committee Chairperson***

Judging

It is up to your school to decide on the judging criteria of the competition. Exhibition of the toys with a voting component or a show-and-tell during recess time is a possible platform to judge the toys. Various modes of judging can be used to select the winners of the SCSA (Schools) Competition. Schools may not just stick to simply one type of judging process but to combine them or implement their own method.

○ Toy display

Students can make use of this opportunity to explain how their toy was made and how to play with the toy. The "play-testing" can generate additional ideas and improvements to the toys, which can be carried out before the toy is submitted to the national SCSA competition.

Toy display at Townville Primary School

○ Show and Tell Presentation

Show-and-tell is a common mode of judging. This is a good way to understand the students' thought process in creating the toy and also to expose students to presentation skills. The judging panel can consist of not solely teachers, but parent volunteers as well, who are often very enthusiastic in helping out and can possibly provide an alternative point of view.

> **The children benefit by gaining confidence through presenting their ideas in front of a crowd.**

Mr Lee Hong Khim
Head of Department (Science)
Pei Chun Primary School

- **Voting**

Instead of judging by a few people, voting by students in the school could be done to select the winners. A mini exhibition could be organised during recess time where students can play with the toy and vote for their favourites.

- **Peer Judging**

What better way to select the most interesting toys for children than for children to decide? It can be carried out as an activity during lessons. Students often have different insights from adults. Through this, they can also learn to share constructive feedback with each other.

Show and tell presentation at West Wood Primary School

Judging Criteria

Schools are free to set their own criteria for the judging of the toys for the SCSA (Schools) Competition. Students are encouraged to explain in detail how their toy works, how they came up with the toy and show understanding of the scientific principles behind it. In the main SCSA competition, toys are judged on various criteria, such as:

- **Science**
- **Creativity**
- **Robustness**
- **Fun and Aesthetics**

The list above is definitely not exhaustive. The aim of the competition is to encourage students to get involved in hands-on activities, sharpen their problem-solving skills, and apply science and engineering concepts while creating their own prototypes. While judging the toys, it is important to keep these objectives in mind.

As the winning toys are meant to be submitted for the SCSA national competition, it is also important to keep in mind the pointers for toy submission mentioned in the next section upon choosing the winning toys.

Certificate

We will provide **certificates for every SCSA (Schools) participant**, and **up to 50 exclusive SCSA token pins**. This will be given out during the toy submission [for SCSA] in July and in accordance with the numbers provided in FORM B. Schools can also provide their own certificates or awards to their students.

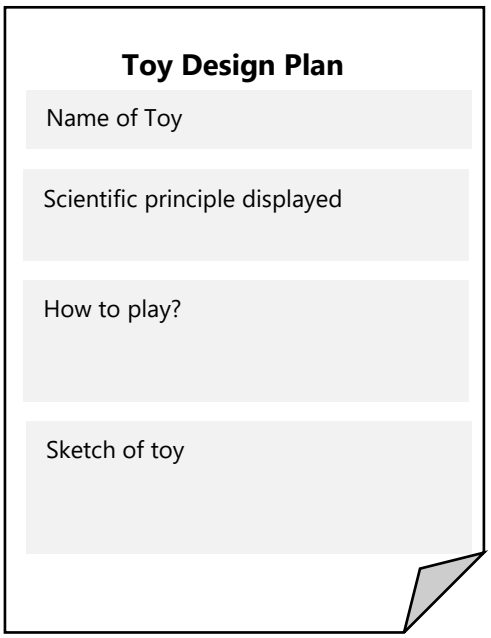
Guiding Students

Students are always full of creative ideas. With appropriate guidance, amazing toys can be produced by them. Here are various ways in which teachers and parents can play a part to help them create their toys.

Ideation

Brainstorming sessions in groups provide students a chance to interact as a team and develop self-confidence through voicing out their ideas to their peers.

Toy design worksheets can help students frame their thought processes. It is an opportunity for them to partake in independent research and exploration for ideas. Students can be encouraged to look around their own environment to draw inspiration.



Workshops

Simple workshops during or after lessons on technical skills can be useful to kick-start projects, as students are often unsure of how to start translating their creativity into construction. An after-lesson consultation clinic can provide students with guidance on how to improve their prototypes. It will be helpful in keeping students interested and encourages them to persevere in solving any problems with their creation.

Teachers may opt to register their students for the workshops organised by the SCSA organisers in February. These workshops are often limited in space and not all students have the opportunity to attend. Hence, students and teachers attending these workshops are encouraged to share what they learnt back in school. Teachers are encouraged to attend the teachers' workshop to learn more on how to guide their school students.

Organise a Toy Take-Apart Session

What better way to learn about making toys, than to deconstruct existing ones! Make surprising discoveries about what mechanisms, motors and wires are used to make these toys work. This is also an inexpensive way to gather materials for making toys and an opportunity to explore new uses for everyday objects. Students can volunteer their old, unwanted or broken toys for the session, and witness them being transformed into brand new handmade ones.

Show-and-tell

Encourage students to share their progress with fellow students and show their works-in-progress and design plans. It is also an opportunity for students to voice out any problems they face with their projects. Exchanging ideas is a good way of generating new ideas and improving on toys. Students and teachers will be able to provide feedback on how to improve the toys.

Examples from SCSA (Schools) Competition 2019

Toy display at Woodlands Primary School

Teachers from Rulang Primary School judging and coaching their students

Students from Horizon Primary School attending to their toy

Journaling of Toy-Making Process

Recording their toy-making process is good practice for students and serves as a good record for their project work. By noting down the process from the ideation stage to the prototyping stage up till its completion, they can better understand the thought process and share their journey with their peers.

Set up a Materials Corner

Toy ideas can often arise simply by looking at what you have. Setting aside a materials corner helps to introduce students to materials that they would otherwise not have thought of using when conceptualising their toy. It can also serve as a resource corner for students while making their toy. Encourage students to donate usable materials to the corner. Keep a look out for unusual items to add to this corner – for example pizza spacer (picture on the right), honey dipper, banana cutter, earphone winder, etc.

Pizza spacer and honey dipper

CONDUCTING A TOY TAKE-APART SESSION

What do you need?

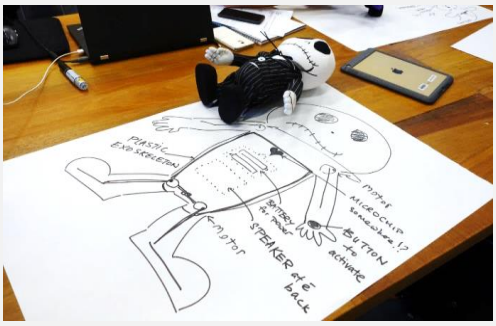
- Mahjong paper and markers
- Toys
- Tools to unravel toys, e.g. screwdriver, pliers, scissors
- Small bowls to keep small parts

What type of toys?

Wind-up toys and electronic plush toys are simple toys that can introduce clockwork, gears, crank and cam mechanisms and circuits.

What to do?

Sit students in small groups to take apart different toys. Before dissecting the toys, get students to predict how they think the toys work. Gather the students in teams to draw on the paper.



As the toy is being dismantled, have students draw and record down the mechanisms and parts in the toy.

Explain to students how the mechanisms work and the scientific principles behind them. Ask students what other materials can be used to replace the mechanisms in the toy.

Reflections

The toy-making journey imparts many values to a student on top of simply winning a competition. It is a developmental journey and it would be beneficial to get the students to jot down and internalise what they have learnt and gained through the project. Make them realise that they are now young creators and innovators! This would encourage the students to be curious and to continue creating and learning science in their everyday lives. Hopefully, they will now look at learning science through a different set of eyes.

Tips for Creating Good Toys

Sturdy Casings

Having sturdy casings for the toys will be very helpful. While cardboard boxes and disposable food containers can be used for toy casings, it is preferable to look for more robust and stable containers. Chocolates, snacks and biscuits often come in thicker plastic or even metal containers, and in different sizes – with the correct tools, these can be turned into good quality toy casings. With better quality casings, the toys can be further ensured to stay intact by the time it reaches the judges for judging.

Size of Toys

An often overlooked consideration by the students and teachers would be the size of the toy creation. Large toys tend to be too complex and less user-friendly, hence compromising the quality of the toy. Toys that are too large also pose many problems when transporting it to school or when submitting the toy, which may result in inevitable damages to the toy.

Instructions

Imagine from the point of the user, an instruction sheet on how to play would definitely come in handy. This helps everyone to better understand the toy and the concept behind it.

List of Items

Include a list of the different parts of the toys and maybe even the materials used, especially if the toy is made up of many different components. Just so we know what got packed in the box!

Maintenance

As with all handmade toys and prototypes, maintenance and repairs are commonplace. Do keep in mind accessibility of certain parts such as batteries, which will require replacing when they run out. Hence, we encourage students to prepare spare parts (e.g. batteries).

Be Different

Encourage students to be creative and make toys from their own ideas.

Resources

Tools & Material

Common Household Items as Materials

Materials and supplies for toys can be found everywhere – encourage your students to be on the lookout for items in their house that can be used for toy making. Stationery, kitchen tools, bathroom accessories are all good sources of materials. Encourage them to reuse items they can find, instead of buying new ones. This allows them to use their creativity, while providing an economical choice.

In the list below are some common items that can be used and is definitely not exhaustive! Basically, anything can be used for creating the toy.

- Biscuit tins
- Cardboard boxes from appliances
- CDs & CD covers
- Plastic bottles & drink cans
- Rubber elastic bands
- Pencils, binder clips, correction tapes and other stationery
- Festive decorations

The winning toy for SCSA 2016 by Lai Shi Jie of Concord Primary School uses many common household items such as food containers, chopsticks and rubber bands.

Where to Find Supplies

That said, should you or the students need to acquire materials to construct the toy, below is a list of some stores where some of the common supplies required can be found.

Where	Locations	What You Can Find There
Daiso	Various outlets in Singapore	Art supplies, sewing & crafting tools Wood, plastic & cardboard sheets Hardware supplies & small electronics
Ikea	Alexandra, Tampines	Powered hand tools Hardware accessories (Eg. Screws, bolts) Art supplies & stationery Kitchen supplies

Where	Locations	What You Can Find There
Cash Converters	Outlets in Ang Mo Kio, Bedok North, Chinatown, Jurong East, Kallang Bahru, Tampines, Toa Payoh & Ubi	Electronic devices Household supplies and appliances Toys Art supplies & crafting tools
Value$	Various outlets in Singapore	Batteries, torchlights Hardware accessories (Eg. Screws, bolts) Art supplies, sewing & crafting tools Household tools
Spotlight	Plaza Singapura and Westgate	Art, craft & sewing supplies Cloth & plastic materials Styrofoam blocks
Mr D.I.Y	Westgate	Art, craft & sewing supplies Styrofoam blocks Paper, cardboard, plastic materials
Art Friend	Bras Basah Complex	Art, craft & sewing supplies Styrofoam blocks Paper, cardboard, plastic materials
Electronics Stores	Sim Lim Tower	Electronics supplies (Eg. wire, batteries, battery holders, buzzers, LEDs, switches)

Note: This list is provided for reference only, and is not an endorsement of any of the suppliers listed.

Online Resources

There are many resources online where you can find more ideas for projects to do with students. Here are some of them:

- **Tinkering Studio**
  (tinkering.exploratorium.edu)
- **Instructables**
  (www.instructables.com)
- **Toys From Trash**
  (www.arvindguptatoys.com/toys.html)
- **Design Squad**
  (pbskids.org/designsquad)

SCSA

Submission of Toys

We welcome schools who wish to take part directly in SCSA national competition, even if you have not conducted SCSA (Schools).

When submitting toy entries for SCSA, the packaging can be crucial. As the toys will be transported around through the various stages from submission to judging, toys should be securely packaged and clearly labelled to prevent any missing parts or mix-up with other entries.

- **Test toys** repeatedly before submitting them. Secure any flimsy parts properly. Make sure the judges will be able to witness the wonders of the student's creation!
- For battery-powered toys, do remove the **batteries** and ensure the toy is **switched off** prior to submitting. Pack batteries in a separate bag.
- **Label all toys** with the provided SCSA sticker labels (Junior WhizKid or WhizKid). Sticker labels should be on the toy itself instead of the packaging. Do label all toy parts with the name and school to ensure the toy parts can be identified easily.
- **Entry forms** (in SCSA brochure) should be packaged with each individual toy.
- **Securely package** all toy parts with the entry form in either a transparent ziplock bag or a box (max size A3 i.e. 45cm X 30cm X 22.5cm). There must be only one toy per container (multiple toys, each in its container, can be placed in a bigger box for transport purposes). Do not simply place the toy in an open-ended paper bag as the toy may fall out.
- **Label the boxes** with the full **school names** for easy recognition during submission and also when collecting the toys after the competition.
- **Please note that submission requirements may change or differ yearly to ease the toy submission process for both teachers and organisers.**

Proper labelling on a visible part of toy.

Good labelling of school name on the boxes.

Final Judging Workshop & Interviews

Shortlisted students will be informed via the schools by End-July. A date between End-August to Early-September will be scheduled for the shortlisted students with our judges in Science Centre Singapore, before the winners are decided. The Final Round will consist of a toy-making workshop challenge and an interview session.

The interview will be held with a panel of judges. The student will present on the toy that she/he has made using a poster, explaining the design of the toy and the scientific concept that is illustrated with the toy. The judges will interview the students regarding their toy-making journey and their understanding of the scientific concepts.

Students at the Final Judging Interviews for SCSA 2019.

Awards Ceremony & Exhibition

Results of the SCSA will be announced at the Awards Ceremony and awarded by distinguished guests. Family and friends of the shortlisted students will all be invited to the event. Shortlisted toys will also be exhibited at the exhibition held in conjunction with the ceremony, where students can then visit and experience the outstanding toys that other students had created. The posters created by the students and used for the final judging interviews will also be displayed. Please note that all winning toys will not be returned to the schools/students, they will be retained by the organisers for future references.

Ms Indranee, Rajah, guest-of-honour at the SCSA 2019 Awards Ceremony and viewing the winning toys at the exhibition.

After SCSA

So what happens after conducting SCSA (Schools) and taking part in SCSA? We hope that creative toy-making will not stop at SCSA for your school.

- **Toy-Making Holiday Project Work**

  Set students some fun holiday homework in the form of a toy-making project! Instead of worksheets, let students work on a physical problem instead which they can eventually play with. This encourages students to engage in constructive play during their holidays.

- **Science Toys Demonstration**

  The science toys created are great engaging demonstrations for students during science lessons. Students can easily visualise the concepts and even recreate it themselves.

Checklist

Sony Creative Science Award

1. **Plan** and discuss with your school on how your SCSA will be carried out.
2. **Register** for SCSA and indicate if your school has conducted SCSA (Schools).
3. **Publicise** the competition to students and **inform** the parents.
4. **Conduct** your own **workshops** or sign up for the workshops organised by us.
5. **Check on students' toy progress**. Additional activities can be conducted after class to assist students in their toy-making process.
6. **Take** more photos or videos of the process!
7. **Collect** submissions from students.
8. **Judge** the toy submissions to select the winning toys [for (SCSA Schools) only].
9. **Present** the **certificates of participation** and **prizes** to student participants.
10. **Submit Report of Progress** using Form B [SCSA (Schools) only], and send us any **photos and/or videos**.
11. **Nominate** you or your colleague for the Blue Ribbon and Diamond Award!
12. **Pack and submit** toys for SCSA.
13. If students are shortlisted for SCSA, inform the parents of the **final judging interview**.
14. **RSVP for SCSA Award Ceremony and Exhibition** held in November. Arrange for your students to come down and be inspired by the other students' creations.

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Good luck and have lots of fun!

See you at the Awards Ceremony and Exhibition!

Website & Facebook

Latest updates on the competition can be obtained from:

www.science.edu.sg/scsa

www.facebook.com/SonyCreativeScienceAward

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