Little Bang and Bright Sparks newsletter

Autumn 2017

Children's Discovery Museum

Welcome

WELCOME to our first *Little Bang and Bright Sparks* newsletter. Our mission is to build a community of practice around out-of-school STEM education.

In This Edition

So, You've done the Little Bang Training. What's next?

1. Refresh

Did you know we have created a series of short(ish) videos to help you recall how to run elements of the *Little Bang Discovery Club*?

You can access them on YouTube:

SESSION 1
COLLECTING & CLASSIFYING
https://youtu.be/1QBo5xy6TWI

SESSION 2
MEASURING & RECORDING
https://youtu.be/uDqy8LThaqc

SESSION 3
EXPERIMENTING
https://youtu.be/4R0f3LJCZB4

SESSION 4
SCIENCE FAIR
https://youtu.be/JfvPKSrbftc

They are also available on USB for a cost of $15 including postage in Australia.

2. Gather the gear

During the training you would have received a full materials list. These are generally readily available items that you can source locally.

CDM can also send you the full kit. The cost for 20 Little Bang discovery boxes is $1,200 and the teaching material for all four sessons is $1,000.

3. Run the program

Add Little Bang to your program and have a great time! Share how it goes. Start planning the next one!

What about the older children?

Children love the challenges that science, technology, engineering and mathematics can offer.

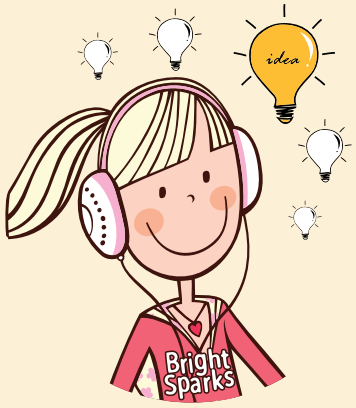
A **science club** is a perfect way for children to regularly participate in the library. You can run sessions yourself and/or engage local contractors to help. CDM is developing class kits of our most popular workshops, complete with presenter notes (YouTube coming soon) and **@home notes**. They will soon be available to purchase at our website.

Join The Revolution

Children's Discovery Museum is continuing to seek expressions of interest from communities interested in offering *Little Bang Discovery Club* in a variety of settings.

As well as in libraries, the program can be delivered in day care centres, community centres and primary schools. Training is a full-day event, and will be delivered with minimum of 5-10 participating libraries or community organisations.

Ask us about costs and availability:
info@childrensdiscovery.org.au



Spark! Discovery Box Enhance Your STEM Collection

Spark! Discovery Boxes

Children's Discovery collaborated with Randwick Library to produce a series of borrowable science boxes called the *Spark! Discovery Boxes.* They are for children aged eight to twelve years to take home and share the joy of discovery with the adults in their household. There are ten different themes and each contains equipment, books and specially created *@home notes*. The *@home notes* are regularly reviewed and updated.
See them at the Children's Discovery website:

www.childrensdiscovery.org.au/programs/spark-discovery-boxes

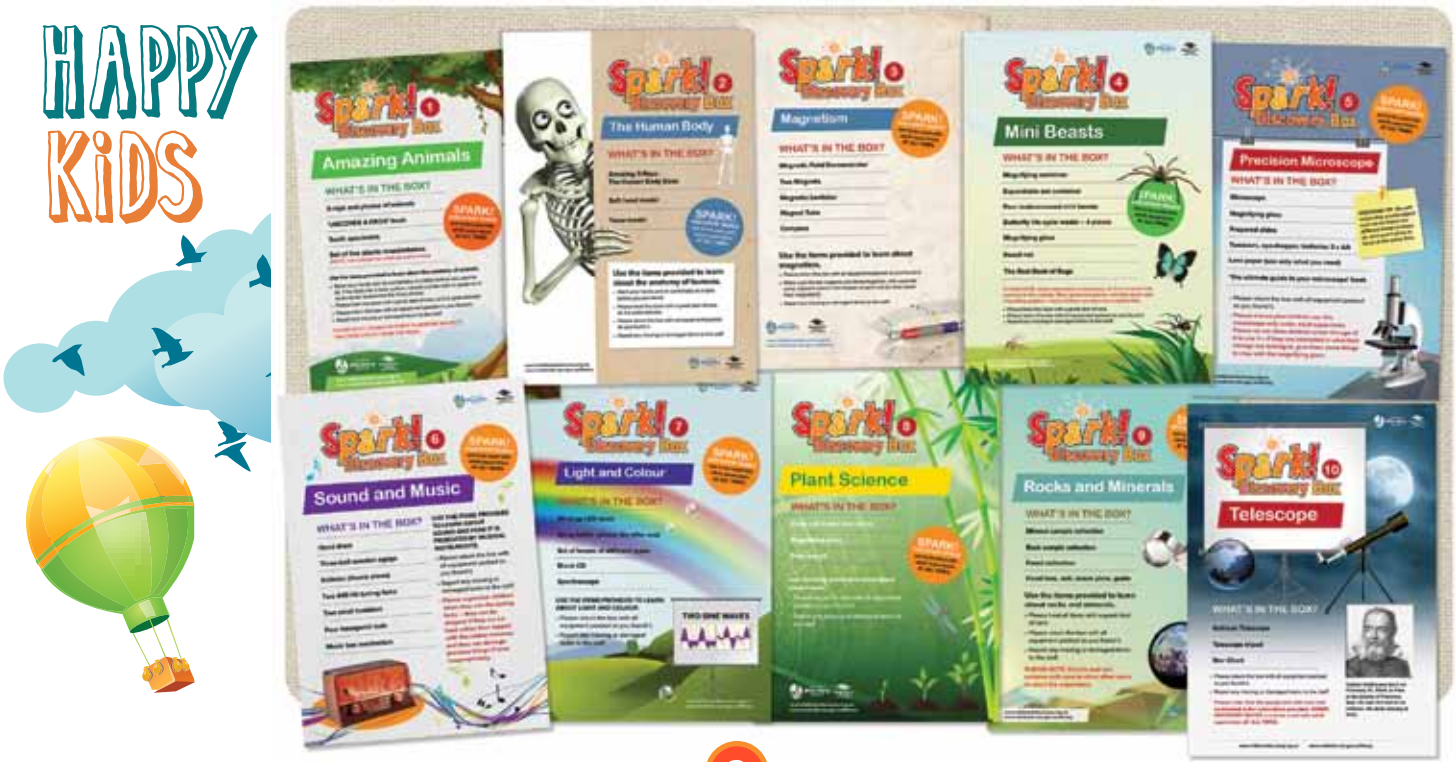
Randwick currently hosts three sets of the 10 themed *Spark! Discovery Boxes,* which are on loan to any member of the library.

Would you like your own set of science boxes? Contact us for details.

Little Spark! Discovery Boxes

A new addition to the *Spark! Discovery Boxes* are the science-themed boxes designed for children aged three to five. **Currently featuring at the Lionel Bowen Toy Library, 669-673 Anzac Parade, Maroubra NSW 2035.**

HAPPY KIDS



Miranda Soliman is the Children's Librarian at Randwick City Library which comprises 3 libraries within Eastern Sydney. In 2011 Randwick City Library started to implement STEM activities aimed at children.

STEM is part of a broader attempt to promote critical thinking for children.

STEM Implementation
A Librarian's prospective

Some STEM based programs that are provided by Randwick City Library include:

- **SPARK !** – "Learning by doing" science activities aimed at specific age groups.
- **DISCOVERY BOXES** – Science theme kits comprising experiment activities, instructions and books to be borrowed from the library.
- **CODING CLUB** – "Learning by doing" programming activities in HTML, Scratch and Python to promote children's interest in computer coding.
- **ROBOTS** – "Learning by doing" activities to promote children's interest in robotics.
- **3D PRINTING** – We have 3D scanners and printers available in the library and we are structuring programs around these.
- **CHESS** – hosted by a Chess expert volunteer teaching critical thinking, problem solving and decision making and design skills.
- **LEGO** – promotes interest in creating and building. Teaching engineering as well as maths skills like sorting, addition and subtraction.
- **MINECRAFT** – encourages independent thinking, initiative, and do-it-yourself creativity.
- **BOARD GAMES** – teaching maths skills like probability.

This paper focuses on the **Spark! Programs** and the **Discovery Boxes** both of which are the result of collaboration with the *Children's Discovery Museum*.

Little Spark! Discovery Club

A four-week science discovery club for preschool aged children and their carers. In 2016 Randwick Libraries ran 12 sessions for preschool children aged 3 to 5 years.

We decided to introduce three to five year olds to STEM related activities. The basic concepts of STEM are **collaboration, curiosity, exploration, creativity** and **critical thinking**, skills that are always in demand. They are intrinsic in young children.

Research shows that preschool programs provide the best place to start focusing on STEM. The best way to do this is through active, hands on, playful activities and practice to make the learning more permanent.

Children are engaged in a hands-on, what-will-happen activity, measuring and weighing, collecting and sorting activities, doing and talking about experiments, building children's vocabulary and concept knowledge—both extremely important from an early literacy perspective.

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Share The Joy

We continuously seek to improve these programs, and look for indicators of their impact. Please help us share ideas and feedback. We would love to hear your ideas, suggestions, what works, what doesn't, any great images (with permissions to reproduce) and testimonials – both yours and your participants.

Link to Survey Monkey
Email info@childrensdiscovery.org.au

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Spark! Science Clubs

Spark! Science Clubs are four weekly, one hour workshops conducted by community groups with connections to STEM, such as science providers companies. Volunteers from Young Scientist Australia attend as *'Spark! Scientists in Residence'*. *Spark! Adventurers Club* for school years K-2 and *Spark! Explorers Club* for school years 3-6. **Workshops provided by science educators including CSIRO, Fizzics & Children's Discovery Museum.**

These sessions are experiment and play based and are structured to involve children and their parent or carer in building experiments to build the child's understanding of a Science topic. The sessions are run as "fun activities" with parents and carers encouraged to participate with the child. We often find that it's not just the kids enjoying the experiments and learning but parents and carers also ask questions they've wondered about and didn't understand from their school days. Often the children can take away something that they made during the session.

The Clubs allow children to interact with ideas in a way they might not be able to in a structured school setting. This open-ended process allows them to engage in trial-and-error experiments of creation, and it also gives them ample opportunity to innovate.

In 2016 Randwick Libraries ran 16 sessions for school years Kindergarten to year 6.

Discovery Boxes for children 3-12 years

Discovery Boxes are science themed kits which parents / carers can borrow from the library. Typically they comprise: equipment and activity instructions enabling the child to build and conduct experiments, instructions which ask questions and suggest directions for experiments and making children think about the results, a book relating to the theme of the box.

Randwick libraries have implemented procedures for building, maintaining, loaning, returning and checking these *Discovery Boxes*.

Collection Development

Spark! session and *Discovery Boxes* provide themes which are among the drivers for our collection development. We have increased the number, diversity and lendings of STEM books due to *Spark!* and *Discovery Boxes*.

Benefits for Children

Spark! sessions are "Learning by doing" in a "play" environment which is different to the traditional school environment for learning STEM skills. Whilst *Spark!* is not an alternative to learning STEM subjects at school, it does provide an alternative and, we believe, complementary vehicle which may inspire some children who may otherwise not be inspired purely by the school environment. The differences between the *Spark!* and school environments include:

1. *Spark!* is an easy-to-access safe and welcoming play experience.
2. The person running the *Spark!* activity may incite passion in some children who don't "get it" at school.
3. There is no pressure to perform, no exams to pass.
4. The child is learning in a different peer group.
5. The child is learning and playing together with their parent or carer.
6. The child discovers, dreams, creates and invents in a relaxed place.
7. Developing an interest in any subject inspires children to read about that subject. If the library can inspire an interest in STEM which might not have been inspired in the school environment then this may also be a pathway to literacy for those children.
8. The child (and the parent / carer) sees that STEM subjects are not "just for school".
9. The library is more accessible than other formal education settings offering services to families at low or no cost and are closer to their homes.
10. Learning that is personal, interest-driven, informal, and supported by peers and mentors.

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Beck observed that "By creating an environment that welcomes newcomers to the community, libraries can become an on-ramp to STEM learning".

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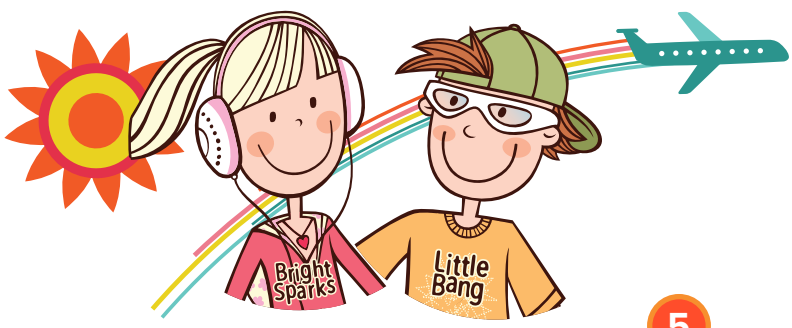
Benefits for the Library

Running the *Spark!* programs has a number of impacts which improve the libraries key performance indicators such as:

- Increased partnership opportunities. Partnering with STEM stakeholders (such as UNSW Young Scientists Association, Robo Gals) provides the library with additional resources to which we otherwise would not have access, including programming resources and additional volunteers. These partnerships and fun, innovative and educational STEM programs have increased the visibility of the library, helped us to better engage with community members and support achievement of our overall goals.
- Some children and parents / carers who attend *Spark!* would not otherwise have visited the library
- *Spark!* engages young customers who may not have been drawn to storytimes, book clubs, or craft programs.
- Some children and parents / carers join the library in order to borrow related books or *Discovery Boxes*
- Libraries are places of continuous learning, not simply book palaces, or physical places for events.
- Schools are no longer solely responsible for educating the public. The "any time, any place, any path, any pace" model broadens learning opportunities and fits well with library STEM programming to allow libraries to engage children who may not have been drawn to storytimes, book clubs, or craft programs.
- Engaging partners to help spread the word about the library's role in learning
- Identifying community needs and embracing a shared purpose.
- Knowing the community including the organizations that are involved in learning, the programs they deliver, the audiences they serve, the capacities they have, and the opportunities for collaboration.

This partnership is proof of the success that can be achieved by extending educational models beyond the boundaries of the classroom and museum into public libraries where they can complement and enrich children's formal learning journeys.



Future Plans

Randwick City Library will continue to run, develop and expand *Spark!* activities and our Discovery box loans.

With planned amalgamation of Randwick, Waverley and Woollahra councils, we expect to roll out these initiatives across more libraries.

During the writing of this paper we are aware that much of our information is qualitative and we realise that it could be interesting to do analysis across several databases within the library in order to show trends such as:

- Borrowing of STEM related children's books, ideally segmenting borrowings by families who have attended *Spark!* sessions.
- Reporting on learning experiences, priorities, and outcomes rather than attendance and circulation.
- Identifying and measuring relevant learning outcomes rather than materials used and program attendance.

Our collaboration with the **Children's Discovery Museum** has given us access to:

- A wealth of specialised knowledge
- Dynamic science educators
- Resources supplied by external funding
- Unique programmes and collections

In return, **Randwick City Library** Service has been able to offer:

- reaching a wider audience through an established community of children and carers.
- A range of science and discovery books to support the programmes.
- Connections to reach out to a large public library network and extend programmes beyond Randwick City.
- Specialised library and collections knowledge and graphic design support to facilitate programmes and collections.

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Special Offer

CSIRO Publishing is pleased to contribute to the Library STEM initiative created by Children's Discovery Museum Ltd. CSIRO are providing fee back copies of Double Helix magazine, to complement the Little Bang Discovery Club or other science club.

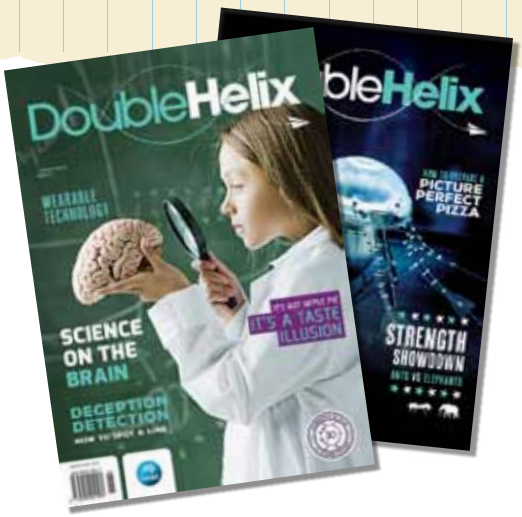
Double Helix is a fun, inspiring and educational magazine targeted at Australian children aged 8–13 years old.

The aim is to foster an interest in the fields of science, technology, engineering and maths.

Eight issues are produced each year, packed with informative and newsworthy content that's structured to develop critical thinking and literacy skills. It includes a range of articles and activities with broad appeal, tested by children through focus groups and surveys.

If you would like to know more about this offer, contact **Jasmine Fellows**, Double Helix Editor, **helix.editor@csiro.au**, phone (02) 6276 6017.

If you wish to subscribe, head to doublehelix.csiro.au to find the latest deals.



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Conclusion

Public libraries have a unique opportunity to become more relevant and valued by providing effective learning opportunities within their communities, building on both existing strengths and new learning tools. They need to be deliberate about how they define and communicate library priorities and more systematic about how they design and deliver learning programs and measure outcomes.

Improving education is a vital national priority, and libraries can be at the centre of achieving that goal.

For librarians: you don't need to have a science background to implement STEM programing. All you need is passion and a willingness to try new things.

Research shows that a comprehensive and continuous approach to learning that begins early, draws on a variety of resources, extends beyond traditional classrooms and is participatory and interest-driven helps children succeed in school, careers, and life.

Public libraries are increasingly becoming a place for informal STEM education in the addressing inequities and issues facing STEM fields. As this movement continues, public libraries can utilize these best and promising practices and recommendations to develop, implement and improve STEM programming in their libraries, effectively addressing issues affecting the STEM workforce. Public libraries have the unique opportunity to engage youth in fun, exciting, and educational STEM programs; further develop the skills and knowledge base of their librarians; partner and collaborate within the community; and increase their support in the community, all while providing necessary informal education opportunities to support STEM fields.

While STEM programs in public libraries are still new, there are already significant resources available to encourage the development, implementation and improvement of STEM programs in public libraries.

References

Beck, J. (2013). The Accidental STEM Librarian: An Exploratory Interview Study with Eight Librarians. A National Center for Interactive Learning Report, Space Science Institute, Boulder, CO

Chesloff, J.D. (2013) STEM Education Must Start in Early Childhood," Education Week, 32, no. 23, 27–32.

Duff, M. L. (2010, August 10). Supporting STEM studies in secondary public school libraries.

Dusenbery, P.B., (2014). The STEM education movement in public libraries, Informal Learning Review, No. 124, 14-19, January/February

Dusenbery, P. B. (2013). The STAR library education network. Washington, DC: Center for Advancement of Informal Science Education.

Dusenbery, P. B., & Curtis, L. (2012). Library exhibits and programs boost science education, Eos, 93(18). Washington, DC: American Geophysical Union.

Haselbuaer, K. (1984). The making of a science librarian. Science & Technology Libraries, 4(3–4), 111–116.

LaConte, K., Halligan, E., & Shipp, S. (2013). Explore: Fun with science in the library. Presented at the annual conference of the American Library Association, Chicago, IL.

MacKellar, P.H. (2008). The accidental librarian. Medford, N.J.: Information Today, Inc.

Reighard, C, Torres-Crespo, M, and Vogel, J. (2016). STEM Curiosity Academy: Building the Engineers of Tomorrow . Vol 14, No 4: Winter.

Shipp, S., Nelson, B., Stockman, S., Weir, H., Carter, B., & Bleacher, L. (2008). Stimulating public interest in lunar exploration and enhancing science literacy through library programs. Presented at the NASA Lunar Science Conference, Moffett Field, CA.

Slutsky, B. (1992). How to avoid science anxiety among science librarians. Science & Technology Libraries, 12(1), 11–19.

Tchangalova, N. (2009). Jumping onto the bandwagon: New librarians navigating the science/technology librarianship. Electronic Journal of Academic and Special Librarianship, 10, 3, Winter.

About Us

Wendy Preston is the Education Officer with Children's Discovery. Wendy completed a Bach App Sci (Phys Ed) and taught high school Physical Education, Outdoor Education and Science for 13 years in Victoria and gained a Master's degree in Early Childhood at Macquarie University, researching time use in families. She is the author of Sydney for Kids and www.sydneyforkids.com.au

Wendy first became involved with Children's Discovery Museum Ltd in 2004 as a member of the Management Committee. She was later employed to develop new programs, including the *Little Bang Discovery Club*; presenting workshops and events nationally and overseas. Wendy's current focus is training regional and interstate teachers and librarians so they can present the *Little Bang Discovery Club* themselves; presenting workshops and other creative tasks.

Adam Selinger is a co-founder and Creative Director of *Children's Discovery Museum*, a non-profit educational charity whose mission is to improve outcomes for children by producing experiences that involve curiosity, creativity, collaboration, confidence and a can-do attitude. Adam developed the concepts and initial experiences for the *Early Start Discovery Space*, Australia's only example of a US-styled children's museum. He is now focussing on building STEM into local libraries and others involved in community-wide education.

National Science ^Book^ Week 2017

Running an event for **National Science Week** is supported at the National Science Week website where there is a guide about running a public event, a guide to generating publicity and templates, graphics and logos to use: **www.scienceweek.net.au/get-involved/organise-an-event.**

You can also add your event to the National Calendar.

But the timing is difficult for librarians, as *National Science Week* is from August 12 to 20 and *Children's Book Week* runs from August 18 to 25!

So why not celebrate both with a *National Science Book Week* event? This year's Book Week theme is **Escape to Everywhere**, which lends itself well to a STEM approach.

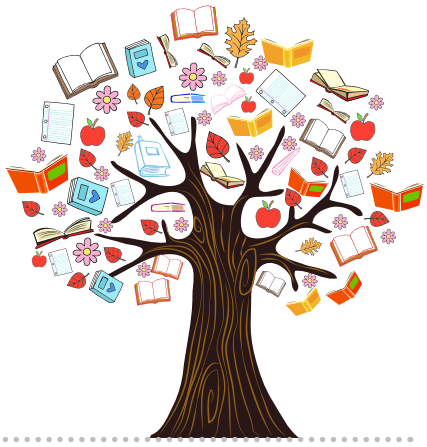
There is a volunteer National Science Week Coordinating Committee in each state and territory: **www.scienceweek.net.au/contacts**.

These committees organise events and can help you connect with scientists in your region. They may also offer grants to support National Science Week events or events at other times of the year.

- The ***National Science Week*** coordinating committee in the ***Northern Territory*** is providing grants of up to $3,000 to support events in the NT. A total of $15,000 is available. **Find out more and apply** by 21 April.
- The ***Queensland National Science Week*** coordinating committee have grants of up to $2,000 for Science Week events, as well as a grant of up to $10,000 for an organisation to stage the launch of *National Science Week* in the state. **Find out more and apply.**
- The ***WA National Science Week*** coordinating committee are offering $2,000 grants for any organisation to run community activities, as well as $500 grants for events staged by Community Resource Centres. **Find out more and apply.**

GRANTS ANNOUNCED FOR MAKER SPACES!!

Grants of $5,000 are now available for organisations to hold STEM-related events and education activities aimed at youth under 18 years of age.



Children's Discovery Museum (Ltd)
ABN: 16 103 244 408
www.childrensdiscovery.org.au
info@childrensdiscovery.org.au

This Inspiring Australia Initiative is supported by the Australian Government