

Science & Sequins – Engaging Girls in STEM Through Wearable Technology

Best Practices for Educators
and Youth Workers



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What Is Science & Sequins

Science & Sequins is an inclusive STEM engagement practice that uses wearable technology and creative creation as a starting point for acquiring digital skills, engineering thinking, and problem solving.

Rather than positioning fashion or aesthetics as "for girls," the practice is designed to broaden the scope of activities traditionally associated with STEM by moving beyond narrow, often male-oriented formats (e.g., robotics, competition-oriented coding).

The approach deliberately integrates design, creativity, and technology to make STEM learning more accessible to young people with diverse interests, while recognizing that girls and young women are often underrepresented in traditional STEM spaces.

The practice was implemented in state high schools in the Bundaberg region in Australia, with academic support from Central Queensland University, and focuses on learning by doing, experimentation, and problem-solving.

Why This Practice Is Needed

STEM activities are often culturally framed as:

- technical rather than creative
- competitive rather than collaborative
- neutral, but in practice aligned with masculine norms

As a result, many young people — particularly girls — may not initially see themselves reflected in these environments.

Science & Sequins responds by:

- expanding what "doing STEM" can look like
- legitimising creativity, design, and aesthetics as part of STEM
- challenging the idea that technical competence must be separated from self-expression

This does not exclude boys, but instead questions gendered assumptions about interests and abilities.





Communication and Self Efficacy

As a youth worker, you can help young women stand firm in their STEM or business ambitions by equipping them with practical skills to understand themselves, communicate clearly, and advocate for their goals.

Keep in mind the Core Idea of the Practice

Creativity, design, and personal meaning are seen as valid starting points rather than exceptions for certain groups of the population, making STEM more inclusive.

Wearable technology is not a gender-specific activity, but rather a means to an end:

- It reimagines technology as something that people influence, rather than simply consume.
- It empowers participants to create objects that are expressive, useful, and personal.



Participants are invited to design a wearable or interactive product that is meaningful to them.

Examples include:

- **accessories, clothing, or objects with built-in lights or sensors**
- **items for personal use, gifts**

The focus is on:

- **creativity**
- **ownership**
- **experimentation**

rather than gender preferences.

Youth workers act as facilitators, not instructors—encouraging exploration rather than providing fixed solutions.

Learning Through Making (Conscious learning)

Learning Culture: Process Over Perfection

Facilitators adopt a hands-off, non-directive approach, encouraging participants to:

- test ideas
- make mistakes
- troubleshoot independently or collaboratively

Mistakes are framed as:

- part of engineering practice
- evidence of learning, not failure

This learning culture is particularly important for groups who may experience stereotype threat, including girls and young women, but it benefits all participants.



Inclusion and Anti-Stereotype Impact

Rather than reinforcing stereotypes, this practice actively:

- challenges the idea that STEM must look a certain way
- disrupts associations between technology and masculinity
- validates creativity and aesthetics as technical competencies

For many girls and young women, this can:

- lower the psychological barrier to entering STEM spaces
- increase confidence and sense of belonging
- support longer-term engagement in STEM and business pathways

At the same time, the practice remains open and relevant to all genders.



Step-by-Step Guide for Youth Workers

Phase 1: Inspiration & Confidence-Building

Goal: Lower fear of STEM and show that technology already exists in everyday life.

What the youth worker does:

- Bring real examples of wearable technology (photos, short videos, or physical objects if possible), such as light-up shoes, smart watches, festival outfits with LEDs, or costume accessories.
- Start with observation, not explanation. Ask participants what they notice before explaining how it works.

Concrete activities:

- Short group discussion:

“Where do you see technology in clothes, accessories, or everyday objects?”

- Reflection prompt (spoken, not written):

“Who do you think usually designs technology? Why do we imagine that?”

Important facilitation note:

Avoid technical terms at this stage. Focus on curiosity, not correctness.

Key message to reinforce:

STEM is already part of everyday life, creativity, and self-expression — not something distant or “only for experts”.



Phase 2: Design & Storytelling

Goal: Help participants connect technology with identity, emotions, and personal meaning.

What the youth worker does:

- Provide simple materials: paper, markers, magazines, fabric samples.
- Encourage choice and ownership — there is no “better” design.

Concrete activities:

- Each participant sketches a wearable item she would actually like to wear or gift.
- Short storytelling round in pairs or small groups: *What is this item?; Who is it for?; What feeling, message, or story does it express?*

Youth worker role:

- Ask supportive questions, not technical ones:
- Do not push complexity or functionality at this stage.

Key message to reinforce:

Technology starts with ideas, stories, and people — not with machines.



Phase 3: Technical Making & Experimentation

Goal: Build confidence through hands-on experience, trial and error, and peer learning.

What the youth worker does:

- Introduce tools gradually: LEDs, conductive thread, simple circuits, basic coding logic.
- Demonstrate one simple example only, then step back.

Concrete activities:

- Participants test how light circuits work using fabric or paper.
- Small challenges instead of instructions:
 - “How many ways can you make this light turn on?”
 - “What happens if you change this connection?”

Facilitation rule (very important):

- Do not fix problems for participants.
- Use guiding questions instead:
 - “What do you think is happening here?”
 - “What did you change just before it stopped working?”

Peer learning moment:

- Encourage girls to ask each other before asking the youth worker.

Key message to reinforce:

Mistakes are not failure — they are part of how engineers and designers work.



Phase 4: Reflection, Visibility & Recognition

Goal: Make learning visible and help girls recognise their own STEM skills.

What the youth worker does:

- Create a supportive moment of visibility (mini exhibition, informal show, photos).
- Guide reflection toward skills, not results.

Concrete activities:

- Participants wear or present their artefacts.
- Group discussion prompts:
 - “What was harder than you expected?”
 - “What did you figure out on your own?”
 - “What skills did you use today?”

Skills to explicitly name together:

- Problem-solving
- Logic and sequencing
- Creativity and design thinking
- Teamwork and communication

Key message to reinforce:

They didn't “just make something nice” — they used real STEM skills.

