



creative schools

GOVERNOR STIRLING
SENIOR HIGH SCHOOL

CASE STUDY — TERM 2 & 3

TERM 2

creative schools

Visual Artist

Jodie Davidson

Teacher

Sophie Bradley

School

**Governor Stirling Senior
High School**

Year group

Year 7 Science

In 2019, with support from the Department of Education and DLGSC, FORM partnered with 16 metropolitan and regional schools to deliver its Creative Schools program. FORM developed Creative Schools in partnership with Creativity, Culture and Education (CCE), an international foundation dedicated to unlocking the creativity of children and young people in and out of formal education, and Hidden Giants, an education consultancy agency supports schools to re-imagine their curriculum by placing 'disruptive', creative, and critical thinking at its heart.

Creative Schools Program aims to improve the learning outcomes of young Western Australians. It does so by activating creative learning strategies through the establishment of meaningful partnerships between teachers, creative (arts) practitioners and young people. The program is a valuable and imaginative addition to class and school strategies for raising attainment, improving well-being and supporting inclusion

Creative Schools engages with the participating school over a full academic year. In Term 1, the creative and teacher participate in an intensive Professional Development on Creative Learning. The program then partners each teacher with a creative practitioner to co-design and co-deliver these learning activities, which focus on a priority area of the curriculum as identified by the school and teacher (e.g. mathematics, HASS or science).

Teachers and Creatives co-facilitate a 90-minutes sessions for students on a weekly basis in Terms 2 and 3. Each class has access to 16 weeks (24 hours) of direct engagement of the creatives with the students. Two classes from each school were selected to participate, a total of 32 classes in 2019. Term 4 is an opportunity to reflect on the program and FORM's independent researcher, evaluates outcomes.

This document describes the activities and outcomes across two terms of delivery: Term 2 and 3 (over 16 weeks). It also includes reflections from school leaders, teachers and students.

ACADEMIC YEAR 2019



TERM 1

PROFESSIONAL DEVELOPMENT FOR ARTISTS AND TEACHERS

Observation and diagnosis of student engagement in the classroom.
Planning time for teachers and artists



TERM 2

PROGRAM DELIVERY IN THE CLASSROOM

Creative Learning workshops per week for eight consecutive weeks



TERM 3

PROGRAM DELIVERY

Learning workshops per week for 8 consecutive weeks



TERM 4

REFLECTION AND EVALUATION OF THE PROGRAM

CURRICULUM FOCUS

Physical Sciences

- Change to an object's motion is caused by unbalanced forces, including Earth's gravitational attraction, acting on the object (ACSSU117)

Use and influence of science

- People use science understanding and skills in their occupations and these have influenced the development of practices in areas of human activity (ACSHE121)

Questioning and predicting

- Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSI124)

Planning and conducting

- Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (ACSI125)

- Measure and control variables, select equipment appropriate to the task and collect data with accuracy (ACSI126)

Processing and analysing data and information

- Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions based on evidence (ACSI130)

Communicating

- Communicate ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate (ACSI133)

General Capabilities

- Critical and creative thinking
- Personal and social capability





CREATING THE CONDITIONS FOR LEARNING

By implementing the Creative Habits of Mind in the form of games, fun and collaboration allowing time and space to foster the forging of new connections vital to creativity and learning. The pedagogy was to be based on exploration, play, trial and error resulting in genuine collaboration that stimulated their imaginations, and harnessed inventiveness and curiosity for learners of all backgrounds, experience levels and abilities. But first we had to generate a feeling that collaborating was ok.

Incorporating the curriculum link was definitely a collaborative teacher artist/classroom teacher process and would not have been possible without mutual respect and support. Our belief was that by building artistic skills and creativity we could strengthen the academic learning which would contribute to a classroom environment that fosters young people's sense of belonging and learning. The task set for students was to create a course, suitable for six types of round balls with varying textures, surfaces and weights, to navigate through incorporating the elements of physical sciences.

THE LEARNING PROCESS

The class of 27, Year 7 students with diverse backgrounds, literacy and engagement levels was initially challenging. Motivating students to engage with learning can be difficult and we had to be willing to try new approaches and allow for repetition in process to offer student the opportunity to reflect and make changes. The easiest way to do this was through warm ups at the beginning of each session.

Session 1 had a mixed result for a number of reasons. The warm up of worked well in pairs and half of the class managed to do it in larger groups however the other half preferred to climb the fences. Persistence was not strong. We visited the Creative Habits of Learning but for most students the language was too complex which resulted in a reduced level of understanding.

Session 2 revisited the same warm up (sticking with difficulty) in an attempt to improve results and familiarity with the process (discipline). What a difference a week made. Being a high school and being ruled by the bell, the 60-minute session meant the warm up had to be quick and effective. Stepping directly outside the classroom rather than wasting time moving to a large area, students were put into the groups they would be working with for their main activity (collaboration).

The process of creating a 3 dimensional ball run with a number of labelled components directly relating to physical science would allow the groups to collaboratively and individually plan and conduct a range of investigation types and experiments to produce an example of a specific physical force (ACSYS125). It would require students to demonstrate critical and creative thinking along with personal and social capability.

Over two sessions the class was provided with an assortment of industrial offcuts from Remida which were to be used to create a particular part of their run (ACSYS126) measuring the success of their balls ability to successfully navigate through the course along the way. Beginning with incline and friction, each fortnight a new element was introduced finishing the term with gears. Not knowing beforehand what the next component would be allowed the development of creative habits of tolerating uncertainty, wondering and questioning, making connections between each component and in some cases, using intuition to suggest what might



come next. Each group got to choose their own type of ball with different textures, sizes and weights. This also allowed for group discussions. Screws, screwdrivers, a drill and tape were used for joining parts together. The process of holding pieces while they were drilled kept even the most disruptive student captivated. Time passed quickly with each session running right through to the bell.

Following the first session making the marble runs, the class had to complete a Practical Investigation. The majority of the class passed by using direct reference to the ball run activity (ACSI130). Based on the results from the Practical Investigation it was determined that students didn't understand some of the scientific terminology particularly wording a hypothesis. To address this, signposts were incorporated into their runs which had to clearly state what was about to happen. The hypothesis needed to be short and direct, perfect for fitting on a sign post. The class were familiar with riding bikes and reading road signs which helped them to understand the concept.

The transition to gravity was intuitively an automatic one although one particular group struggled. They could articulate their ideas but didn't know how to begin building. It was vital to remember that without prior knowledge or experience, it can be extremely difficult to imagine what an outcome should look like let alone how to achieve it. This group were a little like that. Asking them to explain what they were trying to achieve and slowly working through it with them, you could see the tension and frustration drain from their faces and they were back into it. It was the beginning of their run and it had presented a complete roadblock. They made a note of it afterwards on their group's Creative Habits chart which the class has divided into weekly colour codes to indicate whether or not they are using more or less creative habits and how they are doing it.

One particular group incorporated a catapult device while another built a lever to divert the run creating two different courses. As pieces fell apart, they began to work out why tape wasn't always the most suitable option to keep objects stable. The use of slow-motion footage helped them to determine why balls were falling off the course or travelling a certain way and then developing techniques and altering their course

to counteract it (ACSI133, ACSI125, ACSI126). Students were implementing their science inquiry skills without realising.

Making gears was the hardest physical force to incorporate which reflected in both behaviour and motivation. The students could work out how to make the cogs but not how to add them into an existing structure. They were however able to name some of the simple machines that they'd used including tools such as the drill, saw, screwdrivers, glue guns etc that enable force to be multiplied with the use of levers, friction and pressure and how these have made construction, assembly and building less time consuming (ACSSU117, ACSHE121).

The final session gave the class the opportunity to measure their course length and use timers to record data, summarising this to determine which course was the longest and which balls travelled faster on particular courses. They began to communicate their ideas and findings that when a heavier ball was used it went faster which meant that the lighter a ball, the slower it would travel. Sophie was hopeful that this sort of realisation is what they will retain as they move into more complex science in future years (ACSI130 ACSI133).

The last week of term the teacher set a challenge for the class based on a situation in Nepal. Her reasoning was because they had completed the ball run so well, she knew they would know how to go about it. Given selected pieces of equipment, they had to move five cherry tomatoes safely from the mountain (desk), two metres downwards across the river (to the floor). They had two lessons to complete the task. The winning team used a ruler included barriers and a soft base to catch the tomatoes. Another group used a zip line on a string as a pulley to move a cup filled with the tomatoes. Even the group who didn't succeed kept trying and were persistent (ACSSU117, ACSHE121, ACSI125, ACSI126). This suggests that their general capabilities of critical and creative thinking, personal and social capability are growing.

IMPACT OF LEARNING

It was a constant surprise, the individual ways that each group dared to be different, sharing their results and uncertainty but demonstrating their ability to reflect on pieces that didn't work and improve them by giving and receiving feedback not only from teachers but also from each other. The brief reflection time done each week as groups filled in their worksheet after warm ups and again after they had packed up was undertaken automatically without embarrassment when asking what words mean.

They were beginning to show genuine habits of inquisitiveness. They were also getting used to filling out their Creative Habits of Mind worksheets and understanding how they were implementing various habits. Warm ups changed each week depending on habits that were not being adopted as well as they could have or were unsuccessful the first or second time around. When the students realised that we weren't simply giving up because something didn't work, most began to stick with the initial difficulty and push past it. Each week after our warm up we revisited a particular habit complete with examples.

Students didn't have a preconceived outcome. They didn't know what physical force would be added each fortnight or where they would fit it into their course. In some cases, they weren't necessarily working with students of their choice. But they tolerated the uncertainty. They wandered the room when they were stuck for ideas or curious about how another group had made their run work. They asked questions and they continued to try different alternatives until they found success. Students began to pre-empt what the next part of the building was going to be, using intuition as to how it could be pieced into the existing structure. They explored options and continued to investigate the success and sometimes failure of their additions but never did they give up.

One student who hadn't attended any previous classes arrived unannounced. Although he shied away from the warm up, he took some great photos and joined the group who needed the most help with incorporating gravity and levers. He was amazing! Really amazing! He knew how to build, drill and create levers. He understood the mechanics of movement from helping his neighbours to build their house and was able to implement it in his group (ACSHE121). This was the child who it was said, was unlikely that he'd ever come to class yet, he came. He stayed, participated, conversed, understood and was able to show others (ACSIS133). More importantly, he continued to keep working after the siren and he came back.

'Using creativity at the centre of our teaching and learning practices, as a whole school focus, is a fundamental shift for our school. There is a real buzz in the school for access to the creative learning tools, we have had many teachers asking if they can have a creative practitioner in their classroom too. The program is allowing our teachers to focus less on the reproduction of information and more on critical thinking and problem solving through creative learning practices.'

Lizzi Phillips, Artsmedia Coordinator



"After the training days I knew the creative practitioner's role was to come with ideas. It is exactly what I thought it was going to be, but I needed to see how it was going to improve their understanding. We just did a science assessment and they all scored so well in that assessment." (Sophie, Teacher)

"We did a science investigation on forces. These students all went straight to thinking about their marble ball-run ideas and applied it. They just did it, no questions asked. It was a new assessment, but other classes would have really struggled to do it without going through the creative learning process. They did so well in this assessment." (Sophie, Teacher)

"The students hate packing up. They pack up right at the last minute. They don't want to leave, because they are working towards an outcome." (Sophie, Teacher)

"The book smart kids are finding it harder. Some lack the applying skills. They are so used to learning out of a book. This is really good for them. They are really developing other skills in this project." (Sophie, Teacher)

"The science learning is really benefiting." (Sophie, Teacher)

"There is more flexibility in the classroom and good peer learning." (Sophie, Teacher)

"They are developing a real community of learning in the classroom, helping each other, boys helping girls, girls helping boys, helping other groups. They are all working together as a team and now really getting into collaborative learning." (Sophie, Teacher)

"For kids who don't achieve well and who struggle to get information across onto paper they really benefit from this practical application-based style of learning. Some other book-smart kids struggled more because they think: 'This is science and it should all be written work.'" (Sophie, Teacher)

"I have learnt so much from Sophie, e.g. seeing her model behaviour management. It was really daunting for me going into High School for me – and Science. I'm not going to be the teacher, but it's about partnership. Appreciating each other's strengths is what collaboration is all about" (Jodie, creative practitioner)

"Science is better this Term. We actually get to do hands-on activities and that's more enjoyable." (Year 7 Student)

"I think it's a better way of learning." (Year 7 Student)

"Gravity, friction, levers ... we understand these concepts better now." (Year 7 Student)

"This way of science learning is better because you get to cooperate with your group." (Year 7 Student)

"Gravity, friction, levers ... we understand these concepts better now." (Year 7 Student)

"This way of science learning is better because you get to cooperate with your group." (Year 7 Student)

"I've developed creativity this term." (Year 7 Student)

"It's like ArtsMedia and Science together. I would definitely like other classes to be like this." (Year 7 Student)

"We learn about how things are moving. Some things are difficult, like cogs and gears and some things are fun. But it is good to try difficult things some times." (Year 7 Student)





TERM 3

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Visual Artist
Jodie Davidson

Teacher
Sophie Bradley

School
**Governor Stirling Senior
High School**

Year group
Year 7 Science



CURRICULUM FOCUS

Earth and Space Science

- ACSSU115 - Predictable phenomena on Earth, including seasons and eclipses are caused by the relative positions of the sun, Earth and the moon.
- ACSSU116 - Some of Earth's resources are renewable, including water that cycles through the environment, but others are non-renewable. Considering what is meant by the term renewable in relation to the Earth's resources.
- How humans and nature affect extraction versus replenishment such as fossil fuels, hydroelectricity, solar wind, geothermal, biomass.
- Science as a Human Endeavour – purification of water, sustainability of resources, effect on the environment.

Cross-curricular Links

- Nature and Development of Science
- ACSHE119 - Scientific knowledge has changed peoples' understanding of the world and is refined as new evidence becomes available.
- ACSHE223 - Science knowledge can develop through collaboration across the disciplines of science and the contributions of people from a range of cultures.

Science inquiry skills

- ACSIS125 - Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed.
- ACSIS126 - Measure and control variables, select equipment appropriate to the task and collect data with accuracy.

Processing and Analysing Data and Information

- ACSIS129 - Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships in data using digital technologies as appropriate.
- ACSIS130 - Summarise data from students' own investigations and secondary sources and use scientific understanding to identify relationships and draw conclusions based on evidence.
- Analyse how the sustainable use of resources depends on the way they are formed and cycle through Earth systems.

Inquiry and persistence.

- Science Inquiry skills – questioning and predicting, planning and construction.

WHAT WE DID

After a successful Creative Schools Program during term two resulting in high levels of engagement, this class of 27 Year Seven students with diverse backgrounds and literacy levels had developed many positive methods of collaboration. The term three challenge, although still working collaboratively in groups, was for students to work on individual components of a group project with a collaborative outcome. The intent was that the way in which they would undertake their roles would instil a sense of independence and ownership but also enable them to implement responsibility to the other members of their group.

The project of designing a board game with the purpose of challenging other groups' knowledge of Earth and space was introduced gradually. Rather than providing details of their task straight away, it was important to determine what information students already knew with regards to their subject of the Earth, sun and moon. Specific games and warm ups provided clues to the upcoming project while allowing students to experience the practical applications of game design. These also increased their familiarity with individual components such as questions and answers, moveable pieces and persistence.

Game rules, rather than being explained verbally, were demonstrated as an activity. The paving outside the classroom became a giant board game with students playing the role of moveable pieces. This physical experience enabled them to comprehend the result of rules that were too simple or too complicated. Asking the class questions about the sun, Earth and moon and challenging them to provide an answer and then match this with a question generated a set of 60 questions and answers that covered the required curriculum content while increasing familiarity with the topic.

1. **Compare times for the rotation of Earth, the sun and moon**
2. **Compare the times for the orbits of Earth and the moon**
3. **Why do different regions of the Earth experience different seasonal conditions?**
4. **What are renewable and non-renewable resources?**

The set of questions and answers were used as a series of four card games including Go Fish and Pairs in another session. Dividing the class into six groups, each group was given a set of cards. Some cards had a question and answer and some were separated into questions and answers. There was an instruction sheet for three different types of card games. Each group was given a different sheet and, in their groups, they had to lay out their cards and play the game. For some groups the laying out of the cards, particularly when they were question-and-answer, took a lot of time. Other groups who were asking questions that if answered correctly meant the person got to keep the card, were more successful. The games took up most of the lesson and students did more than was expected. Playing the games led them to considerable feedback as part of group reflections particularly as the class was still unaware of what they would be doing during the term. Their successes and difficulties rapidly resulted in the class working out what they wanted in a game and what they didn't.

"There were too many cards and it took too much time."

"Go fish was better because you use your own knowledge."

"It was better because you didn't have to look for the answer."

Within 40 minutes they knew what they wanted in a game and what they didn't. Asking them to guess what they thought the project might be indicated that three of the boys had already worked it out. That was when they got excited. Not because of the project itself but

because they realised that they wouldn't have to do games in the way that we had devised them. Instead they would be responsible for creating the rules of how the game was to be played.

"It can be moving through the Galaxy."

"I'm going to do Monopoly but instead of community chest it'll be a question."

The game had to include a building component which had cross curriculum links units of measurement in maths. It had to include options for players to advance (move forward) and go backwards in the game. The organisation of space allowed for setting up the room so that processes could be observed throughout the term. Students were encouraged to move around the room to gather materials, observe the progress of others and to continuously discuss ideas. A group approach to tasks was utilised to build relationships within the group in order to improve methods of understanding, problem solving and developing resilience with a constant visibility of processes by referring to the Creative Habits of Mind which had been developed during the previous term.

Ongoing reflections during sessions helped to work through any questions and problems encountered. It took a little while for students to get into the mechanics of how their games could work but the more they were able to discuss and share with other groups, the more they engaged with the process. The groups continued working on their games although two groups had difficulties in making sure that everyone had a role to play. For one group there was a definite leader who had taken over the making of the game but wasn't sharing the responsibilities. This meant that the two boys didn't know what to do or how the game was to work. In response to this, they were given their instruction sheets again along with a worksheet for them to use to help with planning their rules.

Acknowledging feelings of frustration particularly when students found information challenging to understand or make sense of meant that during the following session, we could use warm up activities to focus on building those skills. To emphasise that more can be achieved when you work together a selection

of seeds, nuts and sticks were distributed. Each person could only use one hand to build the materials as high as possible in 30 seconds. After 30 seconds the next person would have a turn which continued until everyone had had a go. The final turn was for everyone in the group to use one hand each and work together to build as high as they could. Surprisingly what they achieved as a group was more successful than what they were able to do independently.

Collaboration was continuously developed and improved by working in groups however some groups had difficulty ensuring that every person in that group had a task. Another warm up was called for. Using a template of a paper dice, each group had to nominate one caller responsible for giving instructions. Other members could only use one hand to cut, fold, glue and assemble the dice. Overall, they achieved their goal although the final steps of gluing the sides together proved more difficult than they initially thought. In explaining that the dice could be used for their games, one student replied, "But we can't use the paper dice because the weight will be uneven on each side."

A second warm had the entire class taking part and although they initially had difficulty in giving instructions that consisted of only using shapes without naming the objects followed the same process. Groups focussed and succeeded... and laughed. Afterwards they were asked what they thought the point of the activity was. Most said 'teamwork'.

What specifically about teamwork?

"Communication."

Who communicated? Why was it successful?

"...ooooohhhh, because there was a leader giving directions."

Although it's important for students to learn how to collaborate, for some they required more direction, a suggestion of what to do or what needs to be done. This activity assisted others to recognise this.

IMPACT OF LEARNING

Overall, the classroom generally appeared chaotic however in a class where every student was responsible for a different task, this was to be expected. As board game designs progressed, students began to get a feel for what needed to be done. Unfortunately, before they had time to get into a flow, the bell would go. That is one of the main challenges in working in high school. A student asked if they could continue working on their projects during maths demonstrating discipline and persistence in an attempt to complete their task regardless of their initial uncertainty.

Initially there was a quiet concern about their progress. Three of the six groups had almost completed their games and we're ready to start trials. Three others still had work left to do.

"If we don't finish, I'll take the questions home and get them done." (Student)

Any concern was proven unnecessary after discussing their ideas and planning with each group. They were further ahead than the quick observation had indicated. They knew what they were doing and were steadily moving forward again indicating responsibility and taking ownership of their projects. Undertaking individual tasks, each group member became focussed on the same outcome. There were components of the games that were completely different to anything that could have envisaged at the beginning of the term. The instructions had specified that there needed to be a building component such as a house. One group had used this to create parts of a rocket that need to be collected to build a rocket to reinhabit a new planet. Another made house floor plans which were cut into individual rooms to be collected and pieced together. This imaginative interpretation of the guidelines showed that students were implementing their creative habits of mind.

During trials and listening to explanations of rules showed how well instructions had been followed and how individually each group had chosen to interpret them.

"This game isn't for dumb people like Monopoly." (Student)

One group included throwing a ball as part of their game while another had colour coded house parts on one side enabling players to randomly select pieces and attempt to trade them. A group of three boys sat at the back of the class not working with their groups. Rather than discipline them, they were observed further. They were sitting together going through the question cards testing each other. After all, the purpose of each game was to work through the questions resulting in an increase in knowledge of space. One of the students who was taking part in answering the questions was the same student who had struggled to find his place in his group and it had very little input into the making of a game. He spent most sessions wandering between groups. Maybe it just wasn't his thing. Maybe the concept of a game is unfamiliar to him and maybe the attention required to construct it is beyond what he was comfortable with our capable of. Regardless, he was inquisitive, engaged and participating.

A student who previously barely spoke became the leader of her group. She was the only girl after her female team mate moved schools. To begin with she would do things herself but she had grown, demonstrating this by asking the boys in her group to help and giving directions.

The teacher's observations were that once again, the group with the most academic and 'book smart' students were the ones who appeared to have too many ideas. Their intention of wanting their game to be perfect or correct meant that they often struggled to complete the simple components of the task. They were also the group who appeared to find it harder to grasp giving directions and sharing their ideas with each other. The role of the teacher and creative was not to demonstrate. Instead it was to challenge students to find their own solutions. The process reminded me how little I knew about the subject matter and was as much a learning curve for me as it was for the students. This in itself enabled personal reflection on the ways in which I learn and retain information. This has been beneficial when considering creative applications for learning and in breaking down information dependent on both

personal and student feedback. Understanding how well a warm up activity can be designed to develop learning strategies in response to this feedback has instilled a more concrete approach to my own creative practice.

“This way of teaching was New to me. I like to plan, plan, plan. I had to let them come up with solutions to their problems on their own. It was difficult for me. I had to learn to let it go. As a teacher I want a backup plan, but Jodie said, no let’s give them a go.” (Teacher)

“When they realised they didn’t have to wait for instructions, they really took ownership of their learning. For example they used slow motion videos to help them learn. The feedback from students was incredible.” (Teacher)

“In our PLC meeting we now allocate 20 minutes to focus on integrating creative practices across the curriculum. We asked the 2 teachers and 2 creatives from the Creative Schools program to give little 20-minute sessions and activity sheets, giving teachers a bank of warm-up activities and ideas. During staff meetings we now use the structure of the Creative Schools model to do 5 minute warm up before we start the meeting and reflection at the end. This is ensuring that Creative Schools becomes a part of everybody’s practice and becomes part of the school’s culture and language. It empowers teachers to remember that they are creative at the core and then gives them strategies and a toolkit to use in the classroom.” (Creative Schools co-ordinator at Governor Stirling)



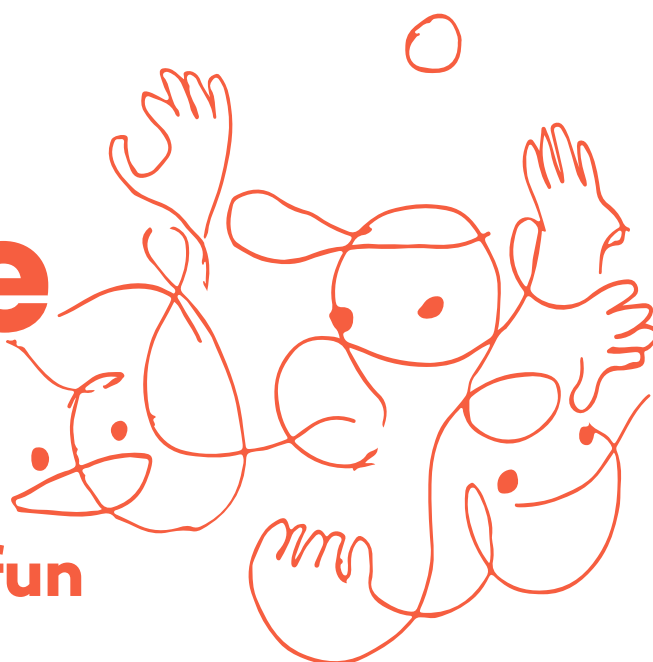




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