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Why Splat?

Because kids were born to design!

Research supports the link between early development of spatial skills and success in STEM subjects (Lubinski, 2010). We live in a 3D world and kids explore and create using visual spatial skills. In fact, thinking and communicating visually in 3D stimulates critical and creative thinking, and is essential for conceptual understanding, spatial reasoning, ideating, rapid visualisation, divergent thinking, problem solving and expressing ideas (Sorby, 2009 & Tytler, 2016). You need to look no further then a set of LEGO instructions to see this type of thinking and communicating in action.

Research also tells us that spatial ability, regardless of gender, is a learned skill that can be improved through practice. However, spatial ability still represents the largest of all gender differences in cognitive abilities (Reilly, Neumann & Andrews, 2017).

To help improve this scenario and develop learners' spatial ability, children can; use and create maps, play with blocks/construction, and draw in isometric. Until now complex and expensive isometric drawing equipment limited students in younger years drawing in 3D. By creating the Splat we aim to remove that barrier, helping children everywhere improve their spatial ability.

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Ten great reasons for using a Splat... All evidence based see references

Improving spatial skills is linked to an increase in STEM outcomes and engagement.

Drawing in isometric (3D) improves spatial skills.

Designing in 3D provides a real world application of geometry.

It's fun! Playful hands-on practice aids engagement and fine motor skills

> Links directly to ACARA curriculum & General Capabilities

> > Drawing aids memory recall and knowledge transfer.

Improves visual problem solving and communication skills.

> Aids the 'Imagination Effect' optimising cognitive load.

> > Supports girls engagement in STEM.

> > > 3

Stimulates critical and creative thinking.

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How to design using a Splat...

The Splat is a template that combines isometric elements to generate the five core 3D shapes (objects) for designing anything. These include; cube, cone, sphere, cylinder and square based pyramid.

Drawing objects can be made much simpler if we start by reducing them to these basic geometric 3D shapes; cube, cone, cylinder, sphere and square based pyramid.

Many designers will also use these core 3D shapes (objects) as guidelines and draw objects within them. This is often called crating.

Our designology follows three simple steps to help break down this process for your students and give them context to start designing.

STEP 1. Identify the basic shapes and learn to draw them with the Splat.

STEP 2. Construct, think about how to connect the basic shapes of use them as quidelines STEP 3. **Design** using the shapes and design elements.

All rights reserved Copyright: Design Nut<mark>s 2019. For use by spe</mark>cific individual user ("Assignee"). For a school licence email admin@splat3d.com Step 1: Identify 3D Objects/Shapes



Splat ® Ava, 7 years demonstrates 3D cube

Teacher: ask a wonder question.

Eg: "I wonder how many 3D objects (3D shapes) there are to design everything?"

Answer: There are five core 3D shapes for design. "What are they?" What object (3D shapes) is missing below?



Look around your classroom and see how many of the shapes above you can see in everyday objects. A drink bottle, pencils ect.

Example: Just like this toy truck.





Using our tutorials or your demo sized Splat, get your students to draw a basic cube or the Splat simple exercise suggested. Include the sphere for stage 3 and 4.

Note: the missing 3D shape (object) is a pyramid.

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Splat ® Design a robot arm





Here we start adding in our design elements to help our design tell a story.

Step 3.







TIP: The narrative behind the design becomes very important during the design phase.

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Design Elements

Design elements are the basic tools students need to use to make their drawings (designs) appear real. Designing with these elements allows us to visualise, explore, improve and share our thoughts more clearly.

Shape (Form) Colour Tints Line Fr EMM Shading (value)Space Texture Overlapping Rough, smooth, bumpy. Check and sizing out our dragon leather. objects appear near and far. All rights reserved Copyright: Design Nuts 2019. For use by specific individual user ("Assignee"). For a school licence email info@nutsnboltsdesign.com

Tip: get students to warm up by using these design elements. Let them invent their own texture like our dragon leather!

Where to start?



We **recommend** you start K-2 students start by playing with the Splat. Next they might trace the Splat. Once they have drawn, doodled or designed something, get them to draw a simple cube.



Splat ® Ava, 7 years demonstrates 3D cube



Splat ® simple exercise cube cone cylinder

After they master the cube, cylinder and cone show them how connect cubes and cylinders.





Splat ® Connecting Cylinders

The technical videos, including drawing spheres, circles and pyramid require a little more fine motor control and we would suggest Yr 2 or above for these exercises. You can see how to draw pyramid, spheres and circle guidelines by reviewing our tutorials on YouTube.

Importantly, you know your students best! It will not take them long to master the Splat and start designing their own ideas in 3D. Simple exercises to develop fine motor skills will aid their progression.

This is just a suggested progression. There are over 70 online tutorials with new videos being added regularly.



Splat ® draw and render cylinders through cube



Splat ® Drawing basic circles for guidelines (sunflower)



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What's next?

We love helping students and schools with their own design projects. If you have an idea for a tutorial please send us an email at admin@splat3d.com. We offer these as a way of connecting with students to encourage them to master drawing their ideas.

Remember to like and subscribe to our FREE YouTube Channel - Splat3D for all our video tutorials., Teachers can access registered training and written classroom resources via our Design School for Teachers (Private Facebook Group) and Design Nuts programs.

Wishing you oodles of creative fun.

Kylie

No. 1 Design Nut!

Plus, stay up to date by joining us @splat3d on Facebook, Instagram and Twitter. Where you can post images using #splat3d and tag us to share your work.

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