Research Project outcome

Example of student work illustrating types of substantiation

**So pretend you’re me. You feel like you’re the odd one out because you are the only one who can see the apparently elusive connections between art and maths. Maybe you’re just crazy but you still have some gut feeling that there must be a connection. So you make up your mind to go and find out if you’re right. Which, unfortunately, involves being kicked out of Art for doing maths, and being kicked out of Maths for doing art. Why don’t they offer a combined subject? That would make life so much easier. A subject called Mart or Arth would be fantastic. Why shouldn’t you draw faces in Maths and fractals in Art?**

**But then along came ‘Research Project’.**

**You can do…whatever…you…want.**

**The Choices. Of course the opportunity to do both maths and art together is too good to pass up.**

**Where to start? First you think you should check if there has been anyone else who has done this before. You go to the all-knowing Google for help. Is there anyone else like me? Yes, yes, there is – M.C. Escher. You think you would definitely marry Escher if he was alive not 116 years old, and if you were planning a wedding for RP – but you’re not. So instead you send thanks in his direction**

**He did all these cool artworks expressing ideas that confused mathematicians like infinity and drawing things that confused everyone – like paradoxes. Pretty awesome guy. And he actually wasn’t that good at maths in school which is interesting as he is now one of the most famous maths artists in the world.**

**Right, so, what about artist that use maths to support their artwork rather than artists that do artworks about maths? You’re totally stuck with that one in class, so if you are a nerd like you are, you pick up your book and read it for a while to distract yourself. The Da Vinci Code. Action, and symbols, and mysteries , and paintings – they always intrigued me. The Mona Lisa which is actually a tiny painting which hung on the wall in some royal French guy’s bathroom for years. The controversial Last Supper – is Jesus sitting next to a boy or a girl? It certainly looks like a girl. Hmm.**

**Right, surely these artworks can’t possibly have connections to maths – they’re all just people, they wouldn’t have maths in. Wait, let me check. In The Last Supper if you draw on all the main horizontal lines in the painting (so the ceiling and the table). Wait, this is really weird – all the pieces of bread lie along this one line, and if you draw a horizontal line at Jesus’ chest height nearly all the hands lie along the line. And then all the vertical lines of the back wall. Hmm. If you follow the lines for the walls, a lot of them line up to the feet underneath the table. That can’t be a coincidence. If you follow the diagonal lines at the top of the painting that are on the ceiling they all line up to Jesus’ face. ALL of them. That’s the vanishing point. Seeing as this painting is 15 feet high [5 metres] and 29 feet [nearly 10 metres] wide with a vantage point of 40 feet it is impossible that Da Vinci did NOT use these guidelines to at least get the rest of the painting right, right? Otherwise it would have turned out really weird and skewed with a strange vanishing point somewhere over here.**

**What about the Mona Lisa? That’s another of Da Vinci’s famous artworks, right? There are lots of questions about this painting — about the horizon line, about the femininity of Mona Lisa herself. But, what if you just draw a box around her face, like this. It lines up with her chin and the top of her head. The long length is 6.9 and the short is 4.1. If you divide them by each other you get 1.6. Wait, you know that number – that’s Pi – and this is a Golden Rectangle. You can actually make a Golden Rectangle with just grid paper just adding another square again and again with side lengths equal to the long sides of the previous rectangle. Then you trace a spiral line around it going from corner to corner. So, if you do the same to Mona Lisa adding squares in the middle and on the outside of that rectangle and making sure that your squares are all going in one direction then drawing a spiral over the picture. Look, it perfectly frames the side of her face.**

**Finally, you look at what you’ve been taught in your Art and Maths classes. What about drawing a face? If you say there’s not much maths in that, you’re actually wrong. You can draw the proportions of a face with everything relative to the eye. You could practically use a formula. The head is seven eyes lone and five eyes wide with the line for the eyes at half-way. The nose is 1.5 eyes long from the eye-line. From the bottom of the nose to the bottom lip is a bit more than one eye. The mouth varies but around 1.5 eyes is about right. From the corner of the mouth to the jaw-line is one eye. From the centre of the nose to the cheek is about two eyes, or a bit more. And there you have a perfectly proportioned face.**

**It’s fascinating.**

**Even Sierpinski’s Triangle is artistic. Being an admirer of art you would salute any artist who draws an infinite amount of lines but it seems that someone already has. Sierpinski’s Triangle is an infinite amount of lines inside a closed shape. It just goes on forever – triangle after triangle. If that’s not an example of maths used in art you’re not sure what is.**

**So, now you have proof. You can return to your classes with your head held high knowing that you’ve solved the mystery. You’ve completed your Research Project, and now you only have to catch up on the subjects you neglected last year doodling in class.**

**Maths and Art really do go hand-in-hand. Mission accomplished.**