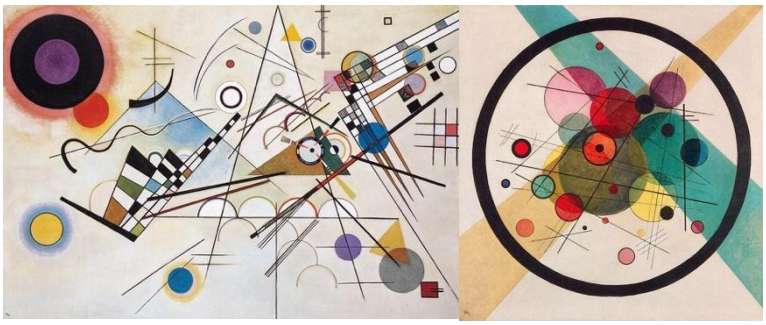
ACTIVITY DOSE PROJECT '22 –

Author: Phyllis Thieuw
School: De Wijzer, Ieperstraat 21, Zonnebeke, Belgium

Title Activity	Drawing bot
Age	☒ **3rd grade primary school (10-12 yo)** ☐ **1st grade High School (12- 14 yo)** ☐ **Higher grades (14+ yo)**
Estimated duration	1 x 75' (preparation) + 1 x 75' (drawing bot)
learning objectives / competences	(The pupils can ...) - be curious about and willing to discover and learn about new things - explore and experiment in the world around them. - think creatively and dare to thread new paths. - detect needs and challenges and create opportunities and innovative solutions for those needs. - come up with a technical solution for a problem based on a need and go through the different steps of the technical process. - (end goals Belgium education)
Short description of the activity	
Can you make a robot that can draw or even write? Yes you can! On any robot in the class, whether it's a BEE-bot of one made of LEGO, you can attach a construction to hold a pen - Even a piece of tape could do the trick. Then program the robot or let it run free. Designing a real manual for another student including building steps and sketches is the next challenge. And drawing: That's Art!	

CONTEXT	
Motivation	Computational thinking is a skill that cannot be ignored in modern education. Every day, we are confronted with with various computer-based elements. We want the pupils to grow in that skill, to learn to think about the underlying issues and to learn to adjust when problems arise. With this training, pupils are introduced to the first steps of computational thinking or more complex solutions and criteria when older.

Where is the STE(A)M integration? (in a few words, small checklist for yourself)	**S: Is a Kandinsky artwork to be equalled or reproduced by a robot? Is a robot artwork produced faster than a hand-made one?** **T: Construction of the robot or the adaptation to hold a pen + programming.** **E: Matching the product to criteria.** **(A:) 'Kandinsky'-like artwork (inspired by)** **M: Polygon figures, forms, lines, computational thinking.**
Methodology and required materials	
Materials	Per class: ● map of vegetable garden ● Per group: ● Lego Spike or equal ● Device with programming app ● Drawing paper ● colours
Coaching & methodology (your 'lesson preparation') Are you paying attention to the research questions you are going to ask? Do you let your pupils investigate on their own?	
Timing: 5' Work format and classroom organisation: groups of 4 to 5 pupils **Timing: 40'** Method and class organisation: groups	**Preface: (introduction, start of lesson, context)** Artist Kandinsky was a Russian-French painter (1866 - 1944). Kandinsky was an abstract artist. He mainly used lines, shaes and colours.  Observing: What stands out? What forms do we often see? **Part 2: Problem** L Artist Kandinsky Junior will soon have an exhibition. He does everything on his own, which means that everything takes a

	lot of time. Time is ticking. How can we help him do it faster with a drawing robot? Criteria: - different shapes and sizes - different colours - artwork looks nice
Timing: 75' Method and class organisation: classroom and groups	**Part 2: Introduction to LEGO spike prime** Introduction to lego spike prime. The students go through the exercise activities on the LEGO® Education SPIKE™ app in groups, together with the teacher (modeling). Then the pupils learn the main programming blocks to complete the task (motors & motion).
Timing: moments of 75' Method and class organisation: groups	**Part 3: Designing a drawing bot** Can you already make a moving robot? Now we add a pen! What should the artwork look like? What colors, shapes or sizes will you use? Make a sketch in pencil beforehand and program the instructions. Let's go! Research questions: What do you want to do? What do you already know from the program? What have you already entered? What do you see happening? What should happen? How can you program that? What other programming blocks can you use? What does the programming block do?
Timing: 15' Work format and classroom organisation: Per group, presentation to the other pupils	**Part 4: evaluation/ reflection** - Evaluation of the predetermined criteria per team - Reflection questions (individually per pupil) - Peer evaluation (individually per pupil)

Tips & tricks

(which would you give to another teacher to make that lesson go more smoothly)

- Go through the program LEGO education Spike Prime in advance.

Additional information / Links:

https://www.youtube.com/watch?v=0_JGCx-vil4

https://www.stemcomputer.be/

https://spike.legoeducation.com/

Contact person: geert.neyrynck@vives.be, Kristof.vandekeere@vives.be