MATHS MATTERS

Quality Mathematics Education for All

Maths Matters is back!

By Melanie Casha Sammut (Education Officer - Primary Maths and Maths Support Team Coordinator)

And we have so much to share with you! Each and every scholastic year presents achievements that deserve to be celebrated, and new challenges and opportunities. Scholastic Year 2020 – 2021 was no exception!

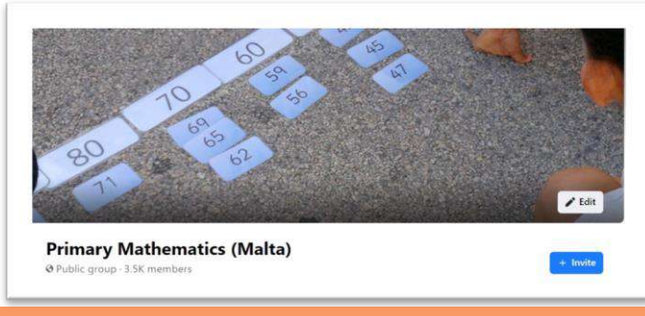
Like other educators did, the Maths Support Team adapted its service to function within mitigation measures set in schools and beyond. This led to the launch of new initiatives and projects such as the webinars' platform *MLounge* and the design of a number of WebQuests, Virtual Maths Trails and Escape Rooms. The Maths Support Team has also designed and made available online quizzes covering all Learning Outcomes in the Primary Mathematics Syllabus (Years 1, 2, 5 and 6) and in the Learning Outcomes Framework (Level 5 : Years 3 and 4). The Team has also planned and recorded 750 lessons covering all the Learning Outcomes from Year 1 to Year 6.

The Maths Support Team has supported primary schools with their Continuous Assessment Plans. Furthermore, the Maths Support Team supported schools that have changed or plan to change their Mathematics textbooks. In the meantime, the Maths Support Team has also encouraged schools in adopting effective pedagogical approaches such as the CPA (Concrete - Pictorial - Abstract) approach (including the Mathematics Toolbox and the Bar Model Approach). Since 2015, the Maths Support Team has invested in professional development and parents' workshops related to the CPA and this led to whole school communities embracing the CPA (or some of its characteristics) as the main approach to teaching and learning Mathematics.

For the first time this year, Malta has celebrated the *International Day of Mathematics* on the 14th March as part of *X'hemM? Għal Dinja Aħjar*. *X'hemM? Għal Dinja Aħjar* spanned over a whole week and provided a platform for 33 primary schools to organise a total of 70 STEM activities intended to target STEM-related aims and different stakeholders.

While success is not solely measured by academic achievement and winning of tournaments, we are proud that once again Maltese students obtained outstanding results in the *superTmatik online Mathematics Challenge* and in the *Mathematics Without Borders International Tournament*. Furthermore, Year 5 Maltese students have obtained an excellent result in the *Trends in Mathematics and Science Study* (TIMSS) 2019. For the first time ever, in any subject and at any level, Maltese students have achieved a score which is higher than the international benchmark in an international study. For a full report about the performance of Maltese students in TIMSS click **HERE**.

The aim of this newsletter is to share some of our practices with you and to invite you to do the same in the next editions of *Maths Matters*. We believe that when we share, we learn from each other and as a result we grow. If you wish to share any of your practices or projects with us please contact me by sending an email on ***melanie.casha.sammut@ilearn.edu.mt*** .



We encourage you to **FOLLOW US** on Facebook and on ***primarymaths.skola.edu.mt.***

Primary Maths Webinars

By Joanne Vella (HoD - Primary Maths)

Teaching is a learning journey. Every year and every decade we tend to look back at what we are doing and observe how much has changed. The strategies we used to practise evolved and may look very different today. This does not mean that what we were doing was wrong. Things evolve for various reasons and one of them is our access to new tools and resources.

Indeed, this scholastic year was a challenge. The Maths Support Team had to rethink the way to support colleges, schools, teachers, parents and students due to the several mitigation measures that we were to follow.

Use of upgraded digital tools made it possible for a different kind of communication and support. We cannot say it is the same, however these tools gave us the means to continue our work and promote new initiatives that we can keep in the future.

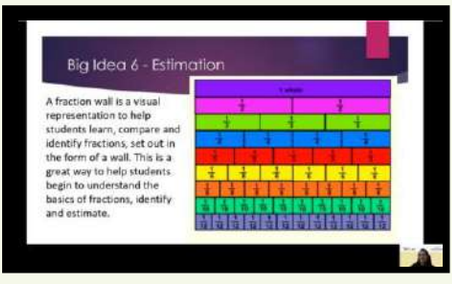
One of these digital opportunities was Webinars. Webinars are a powerful tool that features an array of integrated functions. It is basically an e-lecture with interaction and live communication that can be accessible from the comfort of your class, school, work, home… practically anywhere with an internet connection.

The Maths Support Team launched the MLOUNGE platform precisely for this reason. MLOUNGE is a platform where live webinars are available throughout the scholastic year and participation is on a voluntary basis. Also, aware that not all stakeholders can attend live webinars, some of these webinars were recorded again to be accessed at any time for a specific period. The intention of the Maths Support Team is to keep updating the database of recorded webinars.

We truly believe that such webinars are professional development both for the animator and the attendees. Engaging in professional development makes us learners for the rest of our careers. Teachers learn from other teachers, from other professionals in different fields, from students, from families and other cultures. We learn to try new things. At times we fail, but we try again until we get it right. Just as we need to train our students to be resilient learners we should be resilient learners ourselves.

During the Scholastic Year 2020/21 the Maths Support Team animated 33 live webinars of which 9 were recorded and can be revisited on the new MLOUNGE platform which was launched in December 2021. 991 different stakeholders participated in the live webinars on a voluntary basis, while 550 stakeholders have accessed these recorded webinars through the MLOUNGE platform again on voluntary basis.

Thank you for your support.



Recorded Webinars Available

* Primary Maths Support
* Continuous Assessment
* Learning Outcomes
* Hands-on, Minds-on
* Understanding Fractions
* Mental Mathematics
* Fermi Problems: It's All About the Questions
* Mastery in Maths (and Problem Solving)
* An Integrated Approach (Making Maths Meaningful)

MLOUNGE
primary maths webinar network

https://primarymaths.skola.edu.mt/

Maths Family Connect

By Analisa Magro (HoD - Primary Maths and ECHA Specialist)

A project with the motto of 'Connect with Maths, Connect through Maths', providing opportunities for families of year 5 and year 6 students to explore the subject further, whilst connecting amongst themselves and with others. All this is done in a very casual atmosphere after school hours, where those who attend, do so out of their own interest and initiative.

The project kicked off in 2018 as a pilot project in two local schools, then as an official project offered by DLAP during the following scholastic year. An invite is sent to all schools in Malta and Gozo through a circular, which is then forwarded to parents and guardians, whose responsibility is to place an application if interested. The monthly sessions are offered to students across all sectors free of charge and are held in different schools around the island to maximize accessibility and entitlement to all who are interested. All sessions are different and do not build onto one another. Moreover, sessions are not exclusive to the students of the hosting school, so families may choose to attend as many sessions as they wish.

The need for *Maths Family Connect* arose from the observation that Mathematics is many times seen solely as an academic subject, also very exam driven. This attitude leads us not to appreciate the beauty of the subject and how entertaining it can be, if taken with the right mindset. Engaging in a Maths puzzle, game or challenge can be likewise entertaining as other free time activities and in parallel it also improves one's Maths attitudes, confidence, and skills. *Maths Family Connect* provides this environment, because it is proven that when you are enjoying an activity, you are more likely to develop a positive attitude towards the subject. In fact, international studies like TIMSS also give value to the enjoyment of Mathematics and the positive relationship between attitude and attainment.

Each session begins with a 15-minute discussion and video based on the psychology of a growth mindset, but more importantly this psychology is then applied and reinforced during the activities planned. For example if the discussion was about perceiving mistakes as opportunities for learning, after the session the students were asked to reflect about which was their favourite mistake during the session, the mistake from which they learnt the most. This helped students to perceive mistakes in a different way. They were proud to voice out their mistake because there was a sense of pride that they achieved something from it.

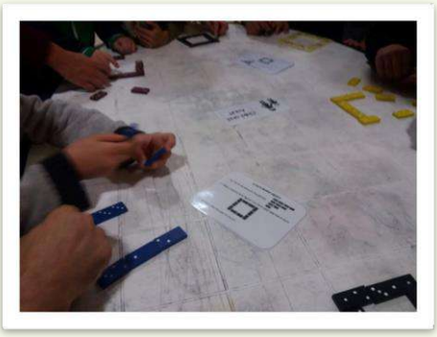
After this introduction families work in stations on rotation basis on activities exploring content, challenges, puzzles and games that support Mathematical learning. Parents, even grandparents are participants not observers. Some activities are done as a whole group of around four families, within the family and others with the parents versus children. A variation is always ensured to make sure different individuals find that activity that really strikes them. Some activities require deep thinking, others are lighter, but smiles and enthusiasm are a common factor throughout. Strong favourite remain those activities which are a direct confrontation between parent and child where both parties give it their all with no mercy on either end.

It is kept in mind that we will be encountering families coming from different backgrounds, families who are reserved, others very bubbly so balance and flexibility are vital to be kept in mind during the planning stages, to make sure that all participants feel welcome and comfortable. Activities are chosen to be graded so students with different levels of Mathematics can work alongside each other on the same activity.

During the past scholastic year, the pandemic has unfortunately stopped us from meeting physically. Though nothing can replace the physical experience, we have offered a Connect experience opportunity during *X'Hemm? Għal Dinja Aħjar*, where families from all around Malta and Gozo met up virtually to discuss energy, efficiency and conservation Scientifically and Mathematically.

Feedback from past participants is very encouraging in various ways. Students were drawn more to the subject and also the level of enjoyment and confidence was increasing. Seen in the bigger picture, together with the priceless work done in schools towards the same aim, such projects are an important link to the whole chain of opportunities in one's educational journey. After all, it is in the family where the roots are, where the first role models are met and where attitudes and expectations are first formed. Let's keep hoping for better times when we can connect as we used to, once more.

MATHS FAMILY CONNECT



MATHS FAMILY CONNECT

The Maths Support Team would like to congratulate Ms Analisa Magro who has designed and coordinates the *Maths Family Connect*. Ms Magro was awarded with the *Distinguished STEM within the Community Award* in the *Malta STEM Education Awards* 2021. Click **HERE** to watch the Malta STEM Education Awards Announcement and **HERE** to watch the Awards Presentation. Congratulations to all winners in the different categories and heartfelt thanks to all the nominees and nominators.

Engaging, Empowering and Listening to the Voice of Parents

By Karen Galea (Maths Support Teacher)

Parents play a fundamental role in the education of their children so empowering them is undoubtedly a way forward. Parental involvement in the teaching and learning of Mathematics is indeed at the crux of the numeracy action plans embarked on by different primary schools around the Maltese Islands.

Senglea Primary School which forms part of St Margaret College is among those schools that have always regarded parents as important stakeholders. Scholastic year 2019-2020 marked the birth of a project focusing on empowering parents in the teaching and learning of Mathematics, in the aforementioned school. From the very beginning of the scholastic year, the Senior Leadership Team, teachers from all year groups, the Head of Department of Assessment for Learning and the Mathematics Support Team member supporting the school, set meetings and discussed how parents can be further involved in the Mathematics education of their children. In-class activities revolving around different Mathematical themes were prepared by the teachers and the mentioned Support Team members. These activities were to be preceded by parental meetings so that parents could make more sense and engage in the tasks presented to their children.

The initial parental meetings concentrated on the importance of involving Mathematics in everyday life. The parents that attended were absorbed by the different ways that Mathematics could be merged into their lifestyle. Enthusiasm was written all over their faces. In particular, parents of children in the Year 3 and Year 4 classes voiced the wish to gain a better insight of certain mathematical concepts. Upon discussion with the Senior Leadership Team, it was decided to set sessions with the interested parents to delve into the mathematical topics they struggle with. This was fuelled by a belief that more confident parents in Mathematics will have a positive ripple effect on their children's attitude towards this subject. The first sessions with the parents targeted fractions as these were specified to be a grey area by the majority of the parents. The meaning of fractions was explored using manipulatives such as Cuisenaire Rods. Parents could experience themselves the CPA approach that is being implemented in their children's mathematics classrooms. The parents' feedback was very positive and their willingness to learn more about Mathematics could be felt in every question they asked.

Despite the hurdles brought about by the COVID-19 pandemic in the scholastic year 2020-2021, this school managed to maintain parental involvement in the teaching and learning of Mathematics. The pandemic negatively affected the mastery of certain learning outcomes. The Year 4 teacher identified the mathematics learning outcomes that needed to be consolidated so that the students could proceed in their learning of this subject. These learning outcomes formed the basis of sessions with parents, prepared and animated by the Mathematics Support Team members supporting this school. Although virtual sessions do not replace face to face sessions, they definitely kept the ball rolling and proved to be beneficial.

Building Bridges – Maths College Meetings

By Analisa Magro (HoD - Primary Maths and ECHA Specialist)

Back in October 2019, the college principal Mr Emile Vassallo, Education Officer for Curriculum Ms Clare Wigg, together with the Senior Leadership Team members of schools within the college and the Mathematics Support Team members embarked on a journey, which despite all hurdles has been ongoing since.

The college organises monthly Maths meetings. During these meetings SLT discuss new initiatives and approaches. This college Maths meetings are intended to put the SLT members in a better position to guide the educators in their respective schools. Over the months we discussed the *Learning Outcomes Framework* and Mathematics continuous assessment techniques, the strengthening of Maths action plans and the introduction of the textbooks amongst others. Important techniques such as the use of Cuisenaire rods and the Bar Model were shared, following which, school representatives would share good practices taking place in their schools. Following such presentations, successes and difficulties are shared in a very positive collaborative atmosphere, conducive to more positive practice throughout the college.

Throughout the scholastic year 2020-2021, we were unfortunately not able to meet in person, yet we kept our monthly appointments nonetheless. The agendas for this year's meetings were elicited from the findings of a college teacher questionnaire, guiding us into ways forward for the college schools. One of the dominant items on this year's agendas was the strengthening of the CPA approach which various schools already had on board and which is also very evident in the new Maths textbooks. Low Floor High Ceiling tasks together with Fermi questions, both catering for students of different abilities, were also explored. Having this space for discussion also saw a strong participation from the college for the nationwide initiative *X'Hemm? Għal Dinja Aħjar*. Meetings during this year were done virtually, which though cannot replace the benefits of social contact, sometimes proved to be more efficient with regards to time-management for multitasking SLT members. Every cloud has its silver lining after all.

This initiative, with all the benefits that it has presented, is highly recommended and it would be positive if other colleges are encouraged to follow in these footsteps. It will be a pleasure for the Maths Support Team to be part of it.

My Maths Journal

By Marthese Morris (HoD - Primary Maths)

The definition of a journal is a diary, somewhere you keep record of your daily activity or thoughts. From a very young age, I always kept a journal and when I get some chance to browse through those writings of the teenage me, I know how far I have grown both in my thoughts, opinions and perspective on life.

So, when at the beginning of my venture with the Maths Support Team back in 2012 I came across Maths Journaling, it captured my curiosity and I wanted to know more. How does it work? What does it involve? Does it make a difference in the teaching and learning of Mathematics? How will it help mastery in Mathematics and its concepts? Can it be utilised as a classroom assessment technique?

Today I keep my own Mathematics journal and like the one I used to keep in my teenage years, I jot down almost weekly, my reflections on different ideas, what I learned new and pose questions about the theories that are still muddy and/or baffle me, the only difference, this journal is solely about Mathematics.

The questions vary and the deeper I look into concepts, ideas and theories, the more I appreciate and recognize Mathematics as a form of art. Understanding the various connections there are within this vast subject becomes engulfing and irresistible. The prompts and questions posed in a Maths journal are not always answered immediately but it gives an incentive and opportunity to dig deeper into it until it is clarified through exploration, research and discussions with others.

There are different types of Maths journaling:

- **Descriptive Journaling** are prompts where learners are asked to illustrate or describe the methods they have used or explain a concept.

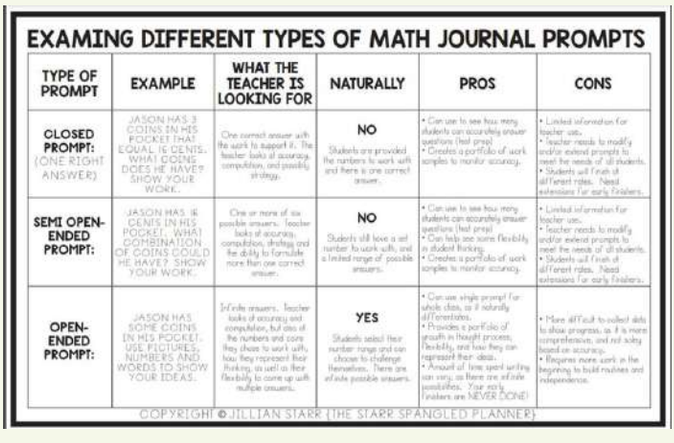
- **Evaluative Journaling** asks learners why they chose a method and how helpful it was to solve the problem. Learners must justify and support the choices that They have made.

- **Creative Journaling** lets learners develop models and stories to show their understanding.

- **Investigative Journaling** encourages learners to explore a problem and document their findings.

- **Formative Journaling** shows what the learners have learned and understood. This is an opportunity for them to reflect on what they found challenging and why. Formative journals are a great way to assess and record progress.

A Maths Journal, at any level should vary and learners should be given the chance to practise the different forms of journaling. Using prompts is one of the most common way to set off Maths Journaling.

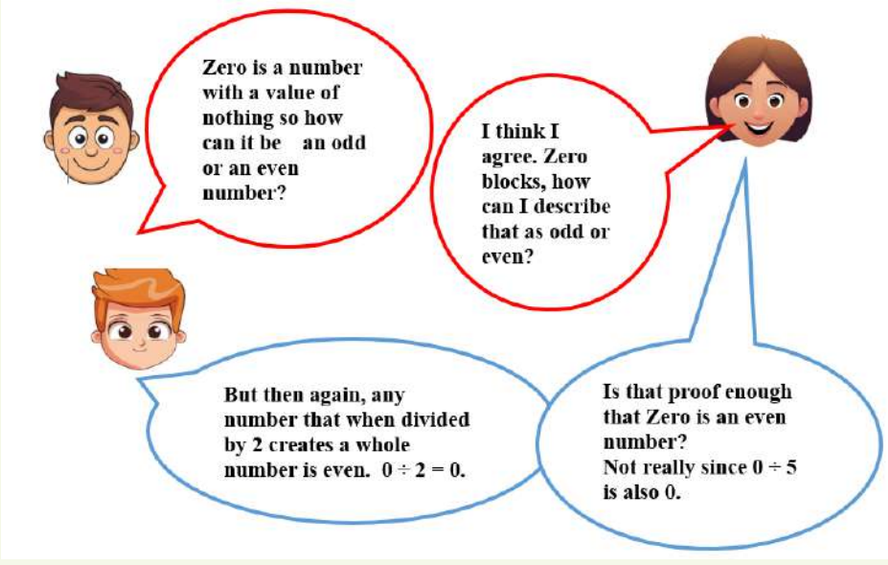


https://jillianstarrteaching.com/math-journal-prompts/

At the beginning ‘modelling’ is crucial given that anything that is new and different in the classroom can be overwhelming to a number of learners. One of the very first questions I had allotted in a Maths Journal was about the number ‘Zero’. This question was proposed to me a couple of years ago by a Year 6 student. Impulsively I wanted to answer the question, however it became a prompt/question for the Maths Journal.

Is ‘Zero’ an odd or an even number?

The reactions were different, but the most common answer was ‘neither’. We had to investigate this and look deeper because we could have been mistaken.



This was the kind of discussion that was created in the classroom. Documenting all this in a journal can help learners reflect on their ideas. Other ideas emerged, for example that since all numbers ending with 0 (0 as a unit) are even numbers then so is zero. A more advanced idea was that we know the pattern in numbers when it comes to odd and even numbers. Before every odd number there is an even number and since 1 is an odd number therefore 0 is even.

Discussing this both with those students and also my colleagues encouraged us to take the bull by its horn and research this idea. This is what Maths journaling is all about. Other prompts may include number curiosities and strange numbers, square and prime numbers. Shapes, symmetry, graphs and percentages are also interesting to explore.

The capacity of inviting learners to record their thoughts in Mathematics cannot be understated as it gives opportunities for rich Maths discourse, development and elaboration. This can contribute to cause a big impact on the teaching and learning of this subject. It is a very valuable and effective tool towards Mastery in Mathematics.

Digital Escape rooms: What? Why? How?

By Jeanelle Attard (HoD - Primary Maths) & Maria Xuereb (Maths Support Teacher)

These last two scholastic years, we educators have relied on the benefits of technology and online teaching and learning more than ever. Instead of postponing or cancelling annual events which are organised yearly, educators, including the Maths Support Team, were proactive to think outside the box to come up with equally exciting experiences for students. Even annual events like X'hemM? and High 5 Junior Mathematician Challenge, this year embraced technology more than ever. In preparation for these initiatives the Maths Support Team members prepared various resources and games, one of which is the Digital Escape Room.

What is an Escape Room?

An escape room is a real-life adventure game, held in a particular themed room with the mission to 'escape' the room. One has to look around the room for hints, codes, patterns, interesting similarities and locks. Every item in the room can be a potential clue that will aid to 'crack the code'. This year, the Maths Support Team created different digital escape rooms, which as their name implies, are web-based escape rooms produced on Google slides, google forms or any other platform. While immersed in this online activity, individuals/teams will be asked to solve riddles and complete puzzles in a fixed amount of time, to complete their mission of "escaping this virtual room."

Why?

For the above mentioned initiatives, members of the Maths Support Team have prepared three different Virtual escape rooms (see links below). These Interactive Digital Escape rooms serve as an opportunity for students to engage in learning by finding clues, solving puzzles whilst practising skills such as collaboration, teamwork, creativity, critical thinking and engaging in maths discourse.

How is it designed?

To set up a digital escape room, one needs to set a scenario/theme for their virtual room. Google slides enables you to set up this virtual room and one has to think about clues or problem solving tasks which students need to solve. Clues or problem solving tasks are hidden around the room and once students click on particular images of objects in the room either a Google form opens for students to work out the task given, or else another Google slide opens and the task is revealed. Once all the tasks have been solved, students will be able to crack the code, unlock the door and escape the digital escape room.

We received a lot of positive feedback from students who participated in the Interactive Digital escape rooms prepared by members of the MSTeam. Students love challenges and digital escape rooms can be a valuable resource when it comes to presenting challenging tasks in a fun way.

Detailed tutorials on how to set up a digital escape room are available online. However, it is recommended to attempt some ready-made digital escape rooms that are available on the internet before creating one yourselves, to get a real-feel of this challenging and yet exciting and fun adventure.

These are the links of Digital Escape Rooms prepared by members in the Maths Support team:

Escape Room 1 (appropriate for year 5 and year 6 students)

Escape Room 2 (appropriate for year 6 students)

Escape Room 3 (appropriate for year 5 students)

We could do better! Suggestions for identifying math talent among girls in Malta

By Amanda Cilia (Maths Support Teacher and ECHA Specialist)

The 2015 *Programme for International Student Assessment* (PISA) study demonstrates that, from the young age of 15, boys are more than twice as likely as girls to aspire for a career as an engineer, scientist or architect by the time they are 30; more than five times more likely than girls to aspire for a career as software developer or applications programmer and almost four times as likely as girls to aspire for a career as an electrical or communication engineering technician (Pisa 2015 Results in Focus, 2018).

Indeed, gender segregation in education is also evident at the University of Malta and MCAST. While 59% of the overall graduates were female in the year 2016-2017 at the University of Malta, only 9.7% out of all graduates were STEM female graduates (Malta Today, 2018).

Mifsud and his colleagues (Mifsud et al., 2005) in their study '*Mathematics in Malta – The National Mathematics Survey of Year 1 students'*, found out that on average girls scored approximately 0.4 of a mark more than the boys on the test. Prof Mark Borg (2019) in his study 'The End-of-Primary Benchmark 2012 – 2018: A Study of Gender and School Sector Differences in Achievement, and in the Achievement Gap' found that in the state sector there are no significant gender differences in Maths in the whole sample in six of seven sessions, with one exception where girls outperformed boys. In the non-state sector, boys did better than girls in Maths with one exception where there was no significant difference between girls and boys. Data collected in the past four years of children who were nominated by schools locally for the *High5 Junior Mathematicians Challenge* shows that more boys than girls are always nominated for this challenge.

How can we close the gender gap in Malta?

As a parent or guardian you can:

- encourage your gifted daughter to challenge herself
- find a mentor
- look out for peers
- use bibliotherapy to model positive influences
- model support in your home first

As an educator you can:

- create a positive environment
- help gifted girls to find a female role model and / or a mentor
- help gifted girls resist gender stereotypes

In the debates about women's underrepresentation in STEM, one common viewpoint is that underrepresentation is not in itself evidence that something is done wrong, perhaps boys and girls have different preferences, and that is why they orient toward different careers. However, research shows that children use the beliefs of their culture to inform how they should live their lives. Therefore, exposure to cultural stereotypes about women's intellectual abilities and about the people in STEM leads boys and girls to develop preferences that they may not have had otherwise. In sending these messages, our culture needlessly limits the career options that boys and girls consider, whether they are gifted or not. It is up to all of us to fix the environment in which children decide what they would like to be when they grow up!

Targeting Students with a Talent in Mathematics

Mathematics Without Borders International Tournament

By Miriam Chetcuti (HoD - Primary Maths)

The Directorate for Learning and Assessment Programmes within the Ministry of Education is providing opportunities for gifted and talented students in Mathematics to nurture their talents. One of these opportunities targeting gifted students is through the participation in the *Mathematics Without Borders International Tournament.* This tournament challenges gifted students and provides them an adequate platform to showcase their exceptional abilities. This tournament encourages a competitive spirit amongst participants and a collaborative team approach. Thousands of students from all the five continents participate in this tournament.

Malta's first participation in the 4th edition of *Mathematics Without Borders International Tournament* was in scholastic year 2016 – 2017. The Top 10 performing students in the national *High 5 Junior Mathematics Challenge* (targeting Year 5 and 6 students) participate in this International Tournament.

The *Mathematics Without Borders International Tournament* targets students of different age groups. 22 Maltese students from different age groups are participating in this year's 8th edition of the Tournament. The three preliminary rounds: the Autumn round, the Winter Round and the Spring Round are held in Malta. This year's qualifying rounds were held as follows:

Autumn Round – 6th November 2020
Winter Round – 5th February 2021
Spring Round – 16th April 2021.

The Winter and Spring Rounds are always preceded by training sessions held with each of the age groups within which the students compete. The training sessions are prepared and animated by Maths Support Team members.

17 000 students from 19 countries[1] took part in the Winter 2021 preliminary round and 15 000 students from 20 countries[2] took part in the 2021 Spring preliminary round. The performance of all 22 Maltese participants was remarkable, winning a total of 31 medals in all the three preliminary rounds: 2 gold medals, 14 silver and 15 bronze medals. The number of students who receive medals in each round is 30% of the total number of participants: 5% receive a gold medal, 10% receive a silver medal and 15% receive a bronze medal.

The *Mathematics Without Borders* final round is usually held over 3 days in Nessebar Bulgaria, but due to the current situation the *Mathematics Without Borders* 2021 final round will be held on the 6th August in Nessebar for the Bulgarian participants only, and in each other participating country for all the other participants. Each participating country will organise a final locally in one venue and on the same date i.e. 6th August, to ensure a fair competition. In the final round, apart from awarding the top places in each age group, a special title, *Math Star Tournament*, is awarded to the most successful contestant of each country.

We are so proud of all the Maltese students who participated in this year's and in previous years' rounds of this tournament and we wish this year's finalists a very big good luck for the coming final round.

[1] (Afghanistan, Azerbaijan Australia, Bulgaria, China, Estonia, Kazakhstan, Kyrgyzstan, Malta, the Philippines, Nigeria, North Macedonia, Romania, Russia, Slovenia, Taiwan, Turkey, Uzbekistan and Vietnam)

[2] (Afghanistan, Australia, Azerbaijan, Bulgaria, China, Estonia, Indonesia, Kazakhstan, Kyrgyzstan, Malta, the Philippines, Nigeria, North Macedonia, Romania, Russia, Slovenia, Taiwan, Turkey, Uzbekistan and Vietnam)

Malta's first participation in the 4th Edition of Mathematics Without Borders International Tournament Final – July 2017, Nessebar, Bulgaria

Malta's second participation in the 5th Edition of the Mathematics Without Borders International Tournament Final – July 2018, Nessebar, Bulgaria

Malta's third participation in the 6th Edition Mathematics Without Borders International Tournament Final – July 2019, Nessebar, Bulgaria

Malta's fourth participation in the 7th Edition Mathematics Without Borders International Tournament Final – August 2020, Malta

Have you heard about the fun quizzes for little MATHEMATICIANS? How can one maximise their use?

By Sarah Camilleri Dimech (HoD - Primary Maths)

The Maths Support Team has designed and made available 56 quizzes; 28 targeting Year 1 young Mathematicians and another 28 targeting Year 2 young Mathematicians. All the learning outcomes in Year 1 and Year 2 level are covered through these quizzes, and each quiz is aligned with a learning outcome/s.

The main aim of these quizzes is twofold; to assess all the learning outcomes in the Year 1 and Year 2 syllabi, and to expose young Mathematicians to non-routine, problem solving questions in a fun and engaging way. The non-routine question in Figure 1 provides young Mathematicians with the opportunity to think critically and work backwards to calculate the correct value that would leave the indicated change when a 20c coin is used. Students in Year 1 and 2 are more familiar with problems whereby the cost of the objects bought together and the coin used to buy the object are indicated, and then they are requested to work out the change.

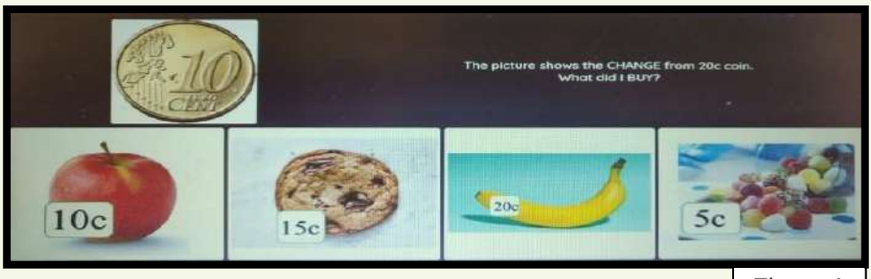


Figure 1

These quizzes provide other highly valid opportunities. For example, most of the questions also provide opportunities for discussion. In the question in Figure 2 students have the opportunity to discuss size and mass together. Is the larger object always the heavier? The balloon is bigger than the orange but the latter is heavier. Young Mathematicians may come up with other comparisons to prove that the largest object is not always the heaviest.

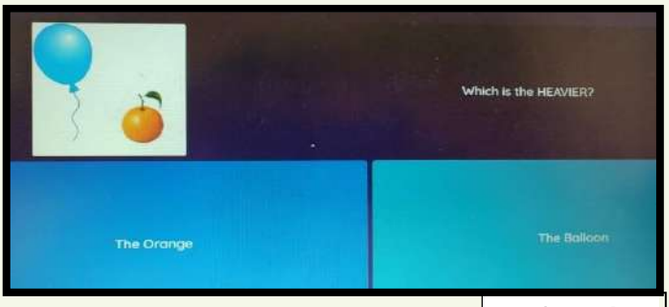


Figure 2

Some questions also assess young Mathematicians' vocabulary in a mind engaging manner. The question shown in Figure 3 assesses whether students know that half full is the same as half empty. Students in Years 1 and 2 will probably know how to identify an object that is half full and another one that is half empty but they might still not realise that an object that is half full can be also described as half empty.

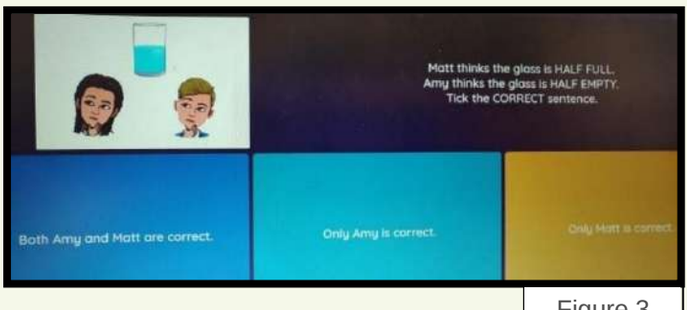


Figure 3

Last and not least, the questions in these fun quizzes may also serve as professional development opportunities for teachers. In most of the questions, one may notice a picture of a concrete resource that is found in the Maths toolbox to be used to teach the particular concept. The question in Figure 4 includes a picture of a ten frame and counters, two manipulatives which can also be provided concretely in class or at home. A student is then encouraged to draw the ten frame with counters to move from the concrete to the pictorial phase. Such pictures are aimed at strengthening the importance of the Concrete-Pictorial-Abstract approach.

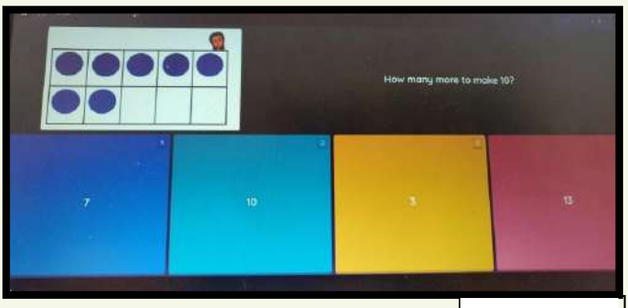


Figure 4

Such fun quizzes are appropriate to be used both at home and at school, as a revision of a learning outcome but also to diagnose young Mathematicians' prior knowledge related to a particular learning outcome. Teachers can also assign these quizzes for homework. When assigned as homework, the software also provides a performance report of young Mathematicians' answers which will help to determine each young Mathematician's understanding and knowledge of the concept at stake. The answers of the questions are shuffled each time one plays the quiz. It minimizes the chance for a young Mathematician to tick the correct answer merely by remembering the position of the same correct answer.

To **Engage in a Quiz** designed by the Maths Support Team follow the links below.

Visit
https://primarymaths.skola.edu.mt/fun-quizzes-for-little-mathematicians/
for Years 1 and 2 Quizzes

Visit **https://teleskola.mt/wacky-weekly/**
for Years 3, 4, 5 and 6 Quizzes and for Family Fun Quizzes on Pop Topics.

To learn more about how you can **EDIT** any of the **Wacky Quizzes** and **GENERATE A REPORT** click **HERE**.

Not all classrooms have four walls.

By Francesca Cutajar (Primary Maths Teacher)

The main mission of the educator is to turn today's dreamers into tomorrow's movers and shakers. As educators, we do our best to encourage our little ones to explore the biggest classroom of them all… how the academic subjects learnt in class are related to our surroundings and everyday life experiences.

STEM Camps by Pembroke's Science Centre, kick-started two years ago, back in 2019. *HSBC Malta Foundation* in collaboration with the *Directorate for Learning and Assessment Programmes* had launched *STEM Camps @ Aquarium* targeting Year 4 primary students. The initiative was aligned to the bank's Future Skills programme which cultivates employability as well as financial capability in the communities in which it operates. The aim was to provide students a holistic experience embracing Science, Technology, Engineering and Mathematics (STEM subjects) and team-building in a non-formal environment.

Through participation in the *STEM Camps*, students further developed their critical thinking, life career and innovative future skills, necessary to equip them for active citizenship and employability.

During the activity, students visited the *Malta National Aquarium* at Qawra together with their teachers and *Malta National Aquarium* presenters cruised through the aquarium in groups of four and worked a set of problem-solving tasks related to Science and Mathematics. Students were asked to get the tablet so as to be able to follow a quiz and answer Science and Maths questions on their tablet. The quiz questions covered both Maths and Science learning outcomes and were all related to the surroundings of the Aquarium.

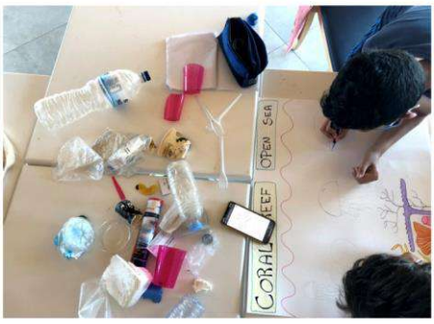
A record number of Year 4 students participated in these *STEM Camps* and could also integrate with students from different schools. Students also had the opportunity to engage with different STEM professionals and carry out other activities related to the Aquarium including the experience of underwater immersion using a Virtual Reality headset (VR). Students could explore and interact within an artificial three- dimensional environment using this electronic device.

The *STEM Camps* initiative was also extended to Year 7 students through *STEM Camps@Esplora*.

The *Science Centre (Pembroke)* has recently launched another initiative, the first edition of *Summer STEM Camp*. Once again this is being held at the Malta National Aquarium. This STEM initiative targets primary and middle-school students who have recently participated in Science and Mathematics STEM initiatives, namely *Junior Science Club*, *High 5* and *Maths Without Borders*. The aim of the *Summer STEM Camp* is to provide students a holistic experience embracing STEM, team-building and the arts in a non-formal environment. The first *Summer STEM Camp* was launched on Saturday 29th May 2021 and consecutive *STEM camps* will run throughout the summer months. The *Summer STEM Camp* initiative is held in collaboration with the *Malta National Aquarium* and kindly sponsored by the *HSBC Malta Foundation*.

During the Maths activity students were invited to go on a mission. They were told that they have been locked out of the aquarium. To go back into the aquarium, they had to have a key to open the door of the aquarium. Students were asked to work out 6 Mathematical tasks to find some information about the aquarium. This information helped them crack a code to open a padlock of a chest in which therewas the key to enter the aquarium again. Students could start from any Mathematical task found around the aquarium. Each time they worked out a task they got a number as an answer. All the answers included details and information about the aquarium for example the number of tanks found in the aquarium or the year in which the Aquarium was opened. The answer of the first task worked out led students to the next task. On top of each task they found the answer of the previous task. By the end of the task students had to have 6 code colours and 6 answers which then were used to open the padlock of the treasure chest. The key found in the treasure chest could help them go back in the Aquarium.

STEM education fosters ingenuity and creativity, creates critical thinkers, builds resilience, teachers' problem-solving, increases science literacy, and enables the next generation of innovators. Such STEM initiatives provide a good platform for meaningful fun too.


CORAL REEF
OPEN SEA

CORAL REEF
OPEN SEA

175
The aquarium has _____ tanks including reptiles, insects, amphibians, amongst others and Mediterranean fish.
AQUARIUM

REDMI NOTE 9S
AI QUAD CAMERA

REDMI NOTE 9S
AI QUAD CAMERA

The SuperTmatik Mental Maths Competition!

By Antoinette Grech (Primary Maths Teacher)

What is this competition? *SuperTmatik* is an international mental Mathematics competition which has been played in schools since 2005. It is becoming more popular each year with schools around Malta and Gozo. This competition promotes interest in mental Mathematics, and it provides students with another opportunity to reinforce their skills in number and mental calculations through constructive play. Nonetheless this competition aims at sharpening and celebrating talent in mental mathematics.

How is this game played? The pack of cards known as the *SuperT* cards are the main resource. The game is divided into categories and levels and can be played by students from 6 years up to 15 years. Each player gets a card and has to work out a mental Maths problem as quick as possible. The player who says the correct answer first will win the card. One face of the card has the mental Maths question, while on the other side there are the answers to the problem and a letter (S, U, P, E, R, T or *). The winner is the person who forms the word **SUPERT** first with the cards won. Click HERE to follow a video showing how the game is played.

This year's official rules had to be slightly amended and all stages had to be played online. Stage one consisted of the school registration and online practice by students. Stage two is the qualifying stage. During this stage each student had to select the time attack option and win the game in less than 60 seconds. Then stage three is the finalists' selection where students who passed stage two had to win a game against the robot for the quarter final, and against another robot for the semifinal. Those students who pass stage 3 are then registered to compete in the grand finale. The final involves a time test where students must correctly solve fifteen Mathematical calculations in the shortest time possible. Each student will be given three goes to achieve the best result.

This year was the 15th edition of the *superTmatik* mental Maths competition, and students representing schools in Malta and Gozo achieved great results, placing 2nd in the overall rankings. The following are the results obtained during this year's competition, where Malta placed 1st in Category 1, 2 and 4 and placed in the top 10 in the other categories.

The table below shows the top ranks for Malta, mainly those students who placed within the top 10 in their respective category.

Category 1	**Placing**	**5250 participants**
Mariano Sammut	1st	Chiswick House School
Kian Casingena	6th	STMC Tarxien Primary
Kian Eman Vella	7th	St Paul's Missionary College
Category 2	**Placing**	**19810 participants**
Ana Sultana	1st	GC Għarb Primary
Martina Galea	5th	GC Għarb Primary
Elaya Attard	7th	GC Għarb Primary
Oliver Buccheri	8th	GC Għarb Primary
Tyler Camenzuli	9th	GC Għarb Primary
Category 4	**Placing**	**29050 participants**
Elisa Chetcuti	1st	STMC Tarxien Primary
Mathias Gauci	4th	St Theresa Primary School Kerċem
Zack Cachia	5th	SBC Għaxaq Primary
Luigi Borg	7th	St Paul's Missionary College
Category 5	**Placing**	**75810 participants**
Matthew Aquilina	4th	GC Għarb Primary
Andrea Micallef	5th	SNC Rabat Primary
Julian Xuereb	8th	GC Għarb Primary
Marino Ivanovski	10th	STC Msida Primary
Category 6	**Placing**	**49840 participants**
Clive Farrugia	7th	GC Middle School
Category 7	**Placing**	**37520 participants**
Jade Borg	3rd	SBC Middle School Kirkop
Category 9	**Placing**	**31430 participants**
Katrina Montebello	3rd	SBC Secondary School
Kylie Fenech	6th	St Monica School Gzira
Haley Xuereb	7th	GC Secondary School
Tiffany Galea	10th	GC Secondary School

The High 5 Junior Mathematicians Challenge 2021

6th edition

A total of 76 Year 5 and Year 6 students from different primary schools have recently completed the sixth edition of the *High 5 Junior Mathematicians Challenge* (*High 5 JMC*).

This enrichment opportunity targeting Mathematically talented students is organised by the **Science Centre Pembroke** within the **Directorate for Learning and Assessment Programmes**. Over 254 students from 58 schools were initially nominated to participate in this year's edition of the *High 5 JMC*.

During the five online after-school workshops, students were actively engaged in hands-on, enquiry-based, challenging Mathematics tasks.

This year's *High 5 JMC* winner is Daniel Grech (Theresa Nuzzo School) while Nathan Tedesco (St Nicholas College, Attard Primary) is the Top Performing Year 5 finalist. Watch the video announcing the Top Performing winners **HERE**.

All winners were presented awards by **HSBC Malta Foundation**. Furthermore, to celebrate the journey of all participating students who made it to the final round, they were invited to participate in a summer STEM Camp at the **Malta National Aquarium**. The summer STEM Camps are organised by the **Science Centre Pembroke** in collaboration with the team at the Malta National Aquarium and sponsored by HSBC Malta Foundation.

Many *High* 5 finalists described their *High 5* Journey and their love for Mathematics through short videos they produced themselves. Watch **HERE**.

The next edition of the *High 5 JMC* will be announced through an official circular issued by the Directorate for Learning and Assessment Programmes towards the beginning of Scholastic Year 2021 – 2022.

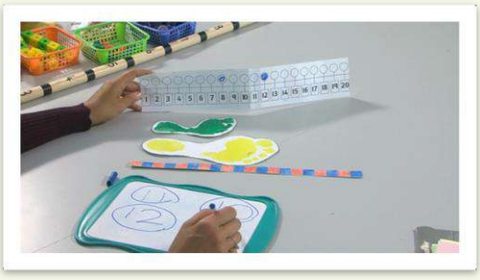
750 recorded lessons covering all the Mathematics learning outcomes from Year 1 to Year 6

By Amanda Cilia (Primary Maths Teacher and ECHA Specialist)

Recorded lessons of school taught subjects have been uploaded and added regularly on Teleskola.mt during this scholastic year. These lessons are being recorded by educators who responded to the expression of interest issued by the Ministry of Education and Employment for this purpose. There are multiple ways of searching for a recorded lesson on teleskola.mt. One can search for a particular topic, view all lessons for a whole week for a specific year, or finally, look at all the available recorded lessons for a certain year and subject.

In this teleskola database of recorded lessons there are 125 Mathematics lessons for each year group from Year 1 to Year 6 covering all the Mathematics learning outcomes for each particular year group. Each lesson is a complete lesson planned meticulously. These lessons are a great resource for learning and revision. These recorded lessons are like having a personal teacher in your home for free, no matter the time of day or day of the week. You can follow the lessons in any way you wish, however the order in which they are uploaded is the suggested order.

These lessons can also be used as professional development by teachers. Teachers benefit when they see other teachers work. Seeing other teachers in action offers credibility, models of intended practice, and promotes comparative and critical reflection where teachers examine characteristics of good practice and measure their own performance against this standard (Jay & Johnson, 2002).



The Concrete Pictorial Abstract (CPA) approach was adopted for these lessons. The CPA approach is a system of learning that uses physical and visual aids to build a student's understanding of abstract topics. Students are introduced to a new Mathematical concept through the use of concrete resources. In these recorded lessons, very often, resources used are things that students can find easily at home.

Also, most of the activities in these lessons are hands-on to engage students actively as much as possible in their learning journey.

Whether you are a parent or guardian, a student, or a teacher we invite you to check out this incredible resource.

WebQuests

An established Teaching Strategy

By Joanne Vella (HoD - Primary Maths)

Three decades ago, significant development in computer and communication technology led the way for intensive use of internet in several domains. This development started to trickle in the education system at a constant pace until it started changing the dynamics of education.

Education experienced a transition that started from books and teachers as the authorities of education to having the internet as an interactive instrument that promotes cooperative study and an effective research tool that helps both teachers and students structure their own knowledge. In fact, the use of internet increases learning participation by learning how to utilize different learning methods, supports the teacher and helps in cooperation both in and out of class activities. However, this new resource needed students to acquire another skill, that to obtain reliable information, evaluate this information and separate the useful information and how to use it towards their needs.

In the earliest days of the World Wide Web (1995), Dr Bernie Dodge a professor at San Diego State University, dreamed of using the newly accessible internet as a tool in education. This idea developed into a teaching strategy. WEBQUEST is “an inquiry-oriented activity in which some or all of the information that students interact with comes from resources on the Internet. WebQuests are designed to ensure meaningful learning by combining technology and hold people actively involved in creating their own knowledge.

Various studies on WebQuests show a positive impact on student academic achievements especially on the students’ learning retention. Use of WebQuests helped improve critical thinking and attitudes towards the concepts they were introduced to. WebQuests ensure the efficient participation of students. Use of WebQuests further encourages students to use the internet as a resource, to access material about the specific area they are studying focusing on the information itself rather than on searching information in irrelevant areas.

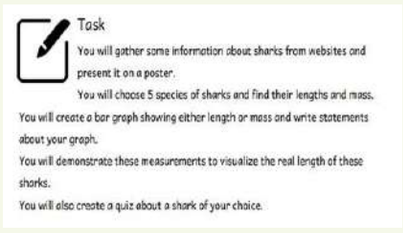
There are two types of WebQuests: short term or long term. A short term WebQuest is meant to be completed in a short amount of time. The preparation and implementation may take from 1 to 3 hours. Such WebQuests can be used to introduce a topic or an idea or to practise a specific concept.

The long term WebQuest gives students the opportunity to analyse information in depth, opportunities to adapt that information in various situations and make conclusions on a specific topic. Long term WebQuests may take from 1 to 2 weeks or even more.

WebQuests have 6 basic components: **INTRODUCTION**, **TASK/S**, **PROCESS**, **RESOURCES**, **EVALUATION and CONCLUSION**.

A WebQuest is frequently based on a topic, an interesting scenario, a case or a story that motivates students.

The **introduction** is often intended to welcome students to the topic and gives them that background information to grab their attention.


Task

You will gather some information about sharks from websites and present it on a poster.

You will choose 5 species of sharks and find their lengths and mass.

You will create a bar graph showing either length or mass and write statements about your graph.

You will demonstrate these measurements to visualize the real length of these sharks.

You will also create a quiz about a shark of your choice.

The **Task/s** is/are the learning goal/s that the students are trying to achieve. This component outlines the task and clearly describes the expectations for the activities. If the students are unsure of what the result should look like, they will not be successful.

The **Process** outlines the steps that the students will take to achieve the WebQuest. This means that the process itself must include clear explanations, steps, and the appropriate tools for them to accomplish the task. Students will not be successful in this step unless the teacher also provides instructions on how to appropriately organize their research.

Process

Task 1

(Individual work)

i) Browse some shark websites and collect interesting information.

ii) Write 5 facts about sharks which include numbers or measures (e.g. number of species, sizes, life span, teeth, whereabouts of these sharks on map etc.,).

(Group Work)

ii) Present them orally or written to your group.

iii) Create one poster about sharks including important information, pictures and/or diagrams.

Resources

https://youtu.be/tfWMwG6aYzQ

https://www.youtube.com/watch?v=HmR8h3t0fEk

https://kids.britannica.com/kids/article/shark/353766

https://www.nationalgeographic.com/animals/fish/facts/sharks-1

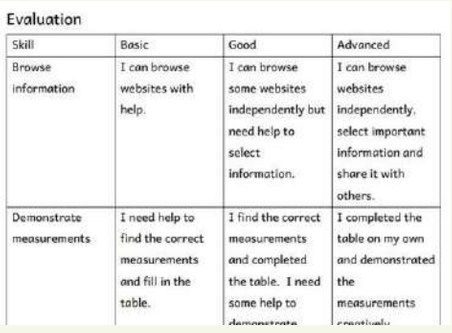
https://kidskonnect.com/animals/shark/

https://www.coolkidfacts.com/shark-facts-for-kids/

https://www.youtube.com/watch?app=desktop&v=ZFk0xhqT5fQ

The **Resources** are the links provided by the instructor which will help students collect the information to complete the task. Having this list is important so that students focus on the knowledge rather than browsing for information in unsuitable sites.

The **Evaluation** can take various forms. It could be one question, several questions, another task or a rubric for students to evaluate their own work. This provides students with a systematic method to understand how well they achieved their goals. It also helps them to determine what works well and what could be improved.


Evaluation

Skill	Basic	Good	Advanced
Browse information	I can browse websites with help.	I can browse some websites independently but need help to select information.	I can browse websites independently, select important information and share it with others.
Demonstrate measurements	I need help to find the correct measurements and fill in the table.	I find the correct measurements and completed the table. I need some help to	I completed the table on my own and demonstrated the measurements

A WebQuest finishes with a **conclusion**, which offers both the teacher and the students a chance for reflection. They can review the knowledge and summarize their newfound understanding. It is possible to extend the activity with further questioning, but a simpler option would be to encourage them to make connections to other ideas.

Conclusion

A lot has been learned on this journey about sharks. The most feared creatures are an important part of the oceans ecosystem. Although they are top predators, humans have been worst and they have affected their populations. There are four species of sharks in the endangered list so it is very important that we see these animals as beautiful animals and how to protect them.

https://seashepherd.org/

WebQuests are an effective strategy in Mathematics because most often Mathematical concepts and skills (at primary level) need to be associated with other learning areas in the Mathematics curriculum, other disciplines and daily life so that meaningful and permanent learning can be achieved. WebQuests are a good way to review prior knowledge, acquire new knowledge and apply to real-life situations, evaluate and analysing along the way. It is also an excellent way to increase product diversity in class. This strategy also allows students to learn these new concepts through their favourite topics and familiar contexts. Finally, WebQuests allow students to learn by themselves, and present a guiding model that activates the student while learning about current topics and have fun.

Readymade WebQuests can be found online however these may need to be adapted to our contexts and age groups. The Maths Support Team has uploaded original WebQuests on **primarymaths@skola.edu.mt** and will continue to upload new ones in the coming weeks. If teachers or schools need support in creating original WebQuests for their schools/classes or can list topics which students find interesting, the Maths Support Team will be happy to take these recommendations and support this teaching strategy.