

Maths Games Envoy Handbook

“Maths is all about having fun as you solve problems”

“It’s good to ensure everyone else is having fun when you are having fun”

**“Problem solving begins with thinking,
fear to think leads to failure.”**

**“Failure is not the end to
everything but a starting point
of learning new ideas”**

“It’s Okay not to know”



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Being a Maths Game Envoy

Who is a Maths Game Envoy?

Anyone excited about playing maths games and learning from them could become a Maths Game Envoy (*also* Envoy). This could include a student, teacher, parent, out of school youth, librarian etc. who, once trained, becomes an agent of change in their community who challenges established views that "maths is boring, hard and only for some" by showing that maths can be fun and accessible for everyone.

What do Maths Game Envoys do?

A Maths Games Envoy introduces and plays maths games with people in their community. They expose people to different types of fun and interesting activities which develop mathematical thinking. They play maths games with whoever they have access to including siblings, friends, classmates, family members, acquaintances etc. They support others to engage by embedding maths game activities into their daily activities.

Why should you become a Maths Game Envoy?

While introducing and playing maths games with people in their communities, envoys gain both interpersonal and professional skills:

- To increase engagement individually, in your family, among your friends and in your community
- Leads to exploration, imagination and enhance curiosity
- To encourage independent and group learning
- Grow confidence and promote social emotional learning i.e. help others learn how to regulate their emotions, pay attention, be mindful of others and work well with peers
- Strengthen families understanding of the value of play
- Engage families and communities in supporting a play based approach to learning.

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What guides a Maths Game Envoy?

A Maths Games Envoy is guided by the following principles carrying out the maths game activities:

- **Playful Learning:** Envoys are actively involved in making learning playful. They understand and can explain to others how play helps people concentrate on tasks and how deep learning can emerge from reflection on such play.
- **Inclusive activities:** Envoys endeavour to ensure that the activities that they facilitate are accessible to their entire audience. They observe barriers experienced and proactively adjust to accommodate any issues or special requirements.
- **Enjoy thinking:** Envoys enjoy thinking about almost anything. They don't give up because something requires deep reflection and are not afraid of having to think hard. They embrace challenges that stretch their knowledge and ability.
- **Everyone learns:** Envoys embrace learning at all times for themselves and others. They aim for all session participants, themselves included, to enter into a task with a learning mindset.

Tools of a Maths Games Envoy

Game Kit

With an Envoy's Toolkit, a Maths Games Envoy helps learners of different ages, backgrounds, communities, and capabilities to participate in playful maths game activities together.

An envoy kit includes:

1. A pack of the Virtual Maths Camp card deck: a card deck that can be used to play standard card games, where each of the 54 cards also features a maths activity.
2. This handbook, that describes who an Envoy is, their roles and responsibilities and guiding principles.

Every card has enough information for participants to get started on the activity and is linked to further information in the accompanying booklet. Each card also contains a QR-code linking to a dedicated website with more extensive explanations, background and extensions as well as a Chatbot code.

How to access the VMC Chatbot:

1. Install the **Telegram App** on your mobile device or computer. Go to Google play or App store and search for "Telegram".
2. Create an account and sign in.
3. Search for the channel **@Virtual_Mathscamp_bot**.

There are 2 possible ways of interacting with the chatbot: receive information corresponding to a card by typing in the code on each card, e.g. 'VMC_9H' or by initiating the chatbot by typing 'mathscamp' to choose a random activity of a specific type.

Tools of a Maths Games Envoy

Key Learning Points

Learn to Play, Play to Learn

A Maths Game Envoy helps people to learn to play well by:

- **Showing the value in following the rules:** An Envoy should encourage people to follow an agreed upon set of rules when playing even if they make them up themselves.
- **Making activities fun:** An Envoy should let people enjoy themselves knowing that this will create the engagement that leads to deeper concentration.
- **Supporting success and failure:** An Envoy should help people to find moments of satisfaction by both succeeding and also making mistakes or failing at tasks.

A Maths Game Envoy recognises that success brings internal motivation but we learn most from our mistakes. So a Maths game envoy should also support people playing to learn by:

- **Encouraging collaboration and teamwork:** An Envoy aims to help people communicate their understanding to others, work together, and appreciate different perspectives.
- **Enabling strategisation and reflection:** An Envoy should support people to think about their actions, both before, to strategise, and after, to reflect.
- **Creating an appropriate challenge:** An envoy should push people to challenge themselves so that they can learn more and deepen their understanding.

My Notes



Problem Solving

A Maths Game Envoy is more than just a problem solver themselves, they need to be able to support others to engage in problems, observing where they are and helping them to take a next step. The aim is to nudge them in the right direction without giving anything away. The following list provides concrete approaches on how this can be achieved, with illustrative questions that can be used to support others:

- **Understand the problem**

- Can you restate the problem in your own words?
- Is there a need to clarify aspects of the problem?

- **Organise**

- Can you draw a visual representation of the problem?
- Can you list what you know, think, want to know?

- **Simplify**

- Can you break down the problem into smaller parts?
- Can you think of a simpler version or special cases?

- **Look for patterns**

- Do you see any patterns to investigate?
- Can you recognise something you have seen before?

- **Use a different point of view**

- Can you look at the problem from a different angle?
- Can you reframe the problem?

- **Guess and check**

- Can you make thoughtful guesses and check them?
- Can you eliminate some possibilities?

My Notes



Storytelling and Gamification

A Maths Games Envoy is able to creatively tell stories and create activities which relate to mathematical ideas. They use stories to:

- **Create memories:**
 - Envoys create memorable experiences through stories
- **Light a spark of curiosity:**
 - Envoys ignite and encourage people's individual creativity and imagination
- **Make abstract things concrete:**
 - Envoys can ground abstract ideas in the concrete making them clear, relatable and familiar

Going beyond stories Envoys also create activities by gamifying mathematical ideas to:

- **Incentivise engagement:**
 - Envoys support people to interact with and personally relate to activities
- **Make reflective things active:**
 - Envoys bring passive ideas to life through interactive activities

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My Notes



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Activity Options

A Maths Games Envoy is aware of different activity types, when they can be appropriate and effective. Each suit of Virtual Maths Camp cards represents a different type of activity:

♣ Puzzles

What: Clubs contain riddles with a single numeric answer

Challenge: Ideally you want to be able to check if the answer is correct without knowing the answer

Opportunity: Designed to ensure deep thinking

♦ Counting Problems

What: Diamonds are counting-based puzzles

Challenge: Ideally you want to be able to check if the answer is correct without knowing the answer

Opportunity: Designed to ensure deep thinking

♥ Fun Facts

What: Hearts contain fun and interesting maths-related curiosities

Challenge: Activities based on fun facts need to be created

Opportunity: There are many creative ways to use storytelling and gamification to engage.

♠ Games

What: Spades contain basic rules and instructions on how to set up and play games

Challenge: Not all games are appropriate in all contexts, and some games can be played without enforcing learning

Opportunity: Games can be deeply engaging

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My Notes



Facilitator Tips

Simple things a Maths Games Envoy can do:

- Be respectful, enthusiastic, patient, and a good listener.
- Ask guiding questions to promote discovery, without giving away answers.
- Know when it is appropriate to give hints and when it is not.
- Help your participants appreciate and learn from failures.
- Encourage different problem solving strategies and techniques.
- Allow your participants to choose the problems they want to pursue.
- Foster collaboration.
- Interact with your audience.
- Ensure that your participants leave saying: *“This was fun! I can do this!”*

Responsibilities of a Maths Game Envoy

See

As a Maths Games Envoy, I am **observant** of others needs and situations.

Say

As a Maths Games Envoy, I am **proactively** helpful and encouraging.

Play

As a Maths Games Envoy, I am **playful** and **engaging**, fun follows me around.

Experiential Learning

As a Maths Game Envoy, I actively reflect on my experiences, to draw out learning and influence my future actions.

- I reflect on good experiences knowing that success should never be taken for granted, small details make a difference and I can always learn more.
- I reflect on bad experiences in the hope to distinguish between things within my control that I can make better and things beyond my control that I need to accept.

For any activity I consider the following questions in my reflection:

- What went well?
- What could be improved?
- What have I learnt?
- Could I benefit from constructive feedback? How could I get it?

Maths Game Envoys in Our Community

After gaining the insight of being a Maths Game Envoy, it is important that we make progress and see maths games grow and glow within not only our inner self but to our everyday interaction. Have you gained a number of gaming options? Then let's play maths games whenever possible. Let's make it more fun. Let us be the envoys of maths games in our community. We can serve the community by practising and playing out math games with anyone in our community, anywhere. Let's talk about maths games with anyone.

We love stories!

We love to play!

We love games!

Wow! We can solve problems!

**What is your experience
with playing math games
in your community?**

Message Now!

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