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Imagine Cup Junior

**Lesson Two - What is AI? Introduction**

Welcome to Lesson Two of Imagine Cup Junior for Beginners! The goals of this lesson are for your students to:

* Learn about the basics of Artificial Intelligence (AI).
  + Learn how to use the API to build an AI.

In this educator overview of Lesson Two, we will again talk through how this lesson works, the PowerPoint slides that you can use, and some extra activities your students can go deeper with if they are curious to learn more. Remember, you can run all five lessons in one day, in the form of a sprint hackathon, or you can schedule them across several weeks or months.

We have a few different types of activities in each lesson. These include:

Rapid Reflection: A chance for your students to reflect on key questions to help guide their learning.

Sprints: These are short periods where your students need to work to the timer and try to achieve the goals listed on the slide.    
Challenge Check-ins: This is a chance for your students to recap what they have done and think about anything they may want to get done before the next lesson.

Submission Tips: We often include tips to help your students maximize their points through their submissions.

Bonus Activities: If you would like to explore the concepts of this lesson further with your students, we also include bonus activities.

Let’s get started!

**Lesson Notes**

**Slide 1:** This is a title slide that you can have up at the beginning of Lesson Two of Imagine Cup Junior.

**Slide 2:**Challenge Check-in. This slide is a check-in to recap what the students have learned so far and what is coming next!

**Slide 3:**This slide is a visual overview for the students of what they will be doing in Imagine Cup Junior. This is to show them that there are four more lessons after this one, but that the focus of today’s lesson is to learn about Artificial Intelligence.

At this point you should be around 5:00 minutes into your 45:00-minute lesson.

**Slide 4:**Submission tips **–** This is a quick reminder to tell your students this challenge is all about using AI in powerful ways. Students must ensure their concept is AI.

**Slide 5:**Rapid Reflection **–** To engage your students with this lesson, ask them to work in their teams (or as a whole class) to brainstorm the ways that they think they have used artificial intelligence today.

**Slide 6 -7:**Artificial Intelligence can be a very complex concept, so in the coming slides we step through it in a very simple way. The goal by the end of this is that your students know how to build AI concepts, drawing on tools that are known as APIs. We start this learning process by engaging with the concept of human intelligence. On Slide 7 we break down five different ways that humans demonstrate their intelligence. We would encourage you to connect these specifically to the experiences of the students in your class. For example, you could ask them how many languages they speak themselves, or what problems they have had to solve today.

**Slide 8 – 9:** Rapid Reflection – Where Slide 7 described elements of human intelligence, now have your students explore whether a machine, robot or computer program could also do these things. What we are moving to here is the definition of AI, which is the idea that a machine, robot, or computer program could think or do things in a similar way that we do as humans. If you have time, you may want to bring this discussion from the teams back to a whole class discussion at the completion of the two minutes.

At this point, you should be around 10:00 minutes into your 45:00-minute lesson.

**Slide 10:** Building on this reflection, you can then provide them with the definition on this slide of AI as ‘an attempt to make a computer, a robot, or other piece of technology ‘think’ and do some things like humans.’ Artificial Intelligence is when computers are trained to try to do things that would usually require human intelligence. So basically, computers are taught how to “think” and perform tasks like humans.

**Slide 11:** A brief history of AI- Highlight key moments of technology evolution that brought us to the current state of AI today. The emphasis here is to tell the story of how AI came to be and to introduce some other terms related to AI. Tell students that they will learn more about generative AI in the next lesson. For reference, here are some additional notes for the key moments in history should you want to go into further detail and discussion:

* 1950s - Birth of AI: This marks the beginning of AI as a field of study. Researchers started exploring the idea of creating machines that could think and make decisions like humans.
* 1956 - Coined Term "Artificial Intelligence": The term "Artificial Intelligence" was officially coined during a conference at Dartmouth College. It became the name for this new field of computer science.
* 1960s - Early AI Programs Developed: In this decade, researchers began creating early AI programs, often using rule-based systems to solve specific problems.
* 1980s - Expert Systems and Rule-Based AI: AI research in the 1980s focused on expert systems, which were programs designed to mimic human expertise in specific domains.
* 1997 - IBM's Deep Blue Beats a Chess Champion: IBM's Deep Blue supercomputer defeated chess grandmaster Garry Kasparov, demonstrating that AI could excel in complex games.
* 2000s - Machine Learning Gains Popularity: Machine learning, a subset of AI, gained popularity as computers started learning from data to improve their performance.
* 2010s - Rise of Neural Networks: Neural networks, inspired by the human brain, led to significant advancements in AI, including image and speech recognition.
* Present - Large Language Models and Generative AI: Today, we have large language models like GPT-3 and generative AI that can understand and generate human-like text, revolutionizing various applications.

**Slide 12**: Recap of Key Terms: the timeline introduced a few key terms that support students in furthering their understanding of AI. These terms are Machine Learning, Neural Network, Large Language Models, Chatbots, and Generative AI.

* Machine Learning: Computers learning from data to make decisions or predictions.
* Neural Network: A computer system inspired by the human brain, used in deep learning.
* Large Language Models: Advanced AI models understanding and generating human-like text.
* Chatbots: AI programs that chat with people, like virtual assistants.
* Generative AI: AI that creates new content, like art or text, on its own.

At this point you should be around 15:00 minutes into your 45:00-minute lesson.

**Slide 13:** Sprint One – In the first ten-minute sprint of Lesson Two your students can work in their teams to go online to research how people have already used AI to try to solve the problem that they have decided to work on as a team. This is a worthwhile use of their time, as one of the ways that their submissions are judged is on how innovative they are. This early research allows them to keep a record of what people have already invented on that problem and helps them to ensure that the idea they end up submitting is different.

At this point you should be around 25:00 minutes into your 45:00-minute lesson.

**Slide 14:** Rapid Reflection –As a way of bringing your students back from their sprint, this is a chance to reflect as a class, and again for you as their teacher to emphasize that when they do begin to innovate their ideas that they are creating something unique and new!

**Slide 15 – 18:** In our training of students around the world in AI, we have found the simple process that we step through in the next slides very easy for them to understand. Essentially AI can be thought of as moving through three steps:

* Step 1: Data is collected.
* Step 2: This is received by the AI (and your students can determine what the ‘container’ of their AI is.
* Step 3: A decision or outcome is created.

We will use this approach in the coming lessons to help your students create their AI concepts, so this is an important process to help them understand. At Step 1, we can therefore ask the question of what data is collected, and how it is collected. This is a good setup for the next video, which explains the Microsoft Cognitive Services and the very important tool called APIs.

**Slide 19:** This video explains the five Microsoft Cognitive Services which are the key areas where Microsoft is supporting the development of AI around the world. Within each of these five services are the various APIs that are currently available (and this list is continually growing). If your students can build out their AI concepts using the APIs, they will score well in the AI section of the judging rubric (this rubric is included at the end of this slide deck).

**Slide 20-21:** Slide 20 shows the five Microsoft Cognitive Services and Slide 21 shows the currently available APIs, which were discussed in the video at Slide 19. If your students would like to explore the difference cognitive services, they can find more information at this page: [Cognitive Services – APIs for AI Developers | Microsoft Azure](https://azure.microsoft.com/en-au/services/cognitive-services/)

**Slides 22 and 23:** AtStep Two of the process your students will determine what their AI is (for example does it sit in a smartwatch, or an app in a phone, or in a website?). This helps them to take something that can feel quite theoretical and begin to give it a tangible feeling. Slide 23 has a video that explains this concept to your students.

**Slides 24 and 25:** At Step Three your students will decide what the decision or the outcomeof the AI will be. The video on Slide 25 explains this final step, in preparation for your students trying out this three-step process themselves.

**Slides 26-27:** Sprint Two - Now it is timefor your students to see if they can bring these three steps together to try to build an AI. For this sprint, have them put their own problem to the side for a moment, and instead try to solve the challenge *‘How can we use AI to improve the lives of elderly people?’.* On Slide 27 there is plenty of information, but essentially what we have here to remind your students is the three-step process, and a list of all of the APIs that they can draw upon.

**Slide 28:** For some fun we then have a video of an AI company that has created a unique solution to this problem of ‘*How can we use AI to improve the lives of elderly people?’.* As your students watch the short video of the Elli-Q AI, have them reflect on which APIs this could use, and what they think of the container (in this sense a rather cute little robot).

**Slide 29:** For the second last slide of this lesson, this is just a quick reminder that your students should ensure that they are including APIs as they think about the AI that they want to dream up, which is exactly what they will be doing in the next Lesson!

**Slide 30:** Challenge check-in. This is a quick moment to recap what your students achieved in Lesson 2. Specifically, they have:

* Learned about the basics of Artificial Intelligence (AI).
  + Learned how to use API tools like APIs to build an AI.

**Slides 31-32:** Bonus Activities - If your students have enjoyed the computer science elements of this lesson, they may want to continue to explore AI and coding in this free Hour of Code lesson in Minecraft Education Edition. [Hour Of Code 2020 | Minecraft: Education Edition](https://education.minecraft.net/hour-of-code-2020) as well as the additional AI lessons using AI available in Minecraft: Education Edition!

**Slide 33:** Judging Rubric - This is the rubric used by the judges to assess your student’s submissions. You can share this with your class and use it to guide their AI concepts as they fill out their PowerPoint Submission Template.

**Conclusion**

Lesson Two done! As you can see, this PowerPoint slide deck is set up to step your students through Imagine Cup Junior in a really simple way, and to help them learn about AI and invent a great idea to submit. This lesson has the most content of the six lessons, so well done to you and your students for learning these new ideas (which can sometimes be challenging to understand!).

Great work running Lesson Two, and have fun preparing for Lesson Three where your students will dig into the different kinds of AI with a focus on generative AI!