Day 1 - Monday, April 1, 2019  
Location: MIT Media Lab, E14-6th Floor

8:45 am  
Welcome and J-WEL Updates  
Dr. Vijay Kumar, Executive Director, J-WEL

9:00 am  
Keynote: The Schwarzman College of Computing  
Provost Marty Schmidt

9:45 am  
J-WEL Integrated Vision  
Dr. Vijay Kumar and J-WEL Collaboratives

11:00 am  
Welcome to pK-12 @ J-WEL Week!  
Prof. Angela Belcher and Prof. Eric Klopfer, Faculty Directors, pK-12 @ J-WEL; and Dr. Claudia Urrea, Associate Director, pK-12 @ J-WEL

Welcome from the pK-12 Collaborative @ J-WEL and participant introductions.

11:45 am  
Inspiring Teaching at MIT  
Prof. Angela Belcher, James Mason Crafts Professor of Biological Engineering and Materials Science and Engineering

1:30 pm - 3:00 pm  
Hands-On Learning at MIT

In the spirit of MIT’s “mens et manus” motto, join different labs, projects, and initiatives from all across campus for a hands-on experience of learning at MIT.

Promoting Experiential Learning and STEM skills with Makerspaces in K-12  
Diane Brancazio and Leilani Roser  
4-409 Edgerton Center Student Project Lab
In this session we will review Edgerton Center programs for grades K - 12, specifically Maker Education. We will present the takeaways from our current pilot course “Master Making in the Classroom” and our year long effort (“Learning Supported by Making”, completed in August 2018).

Participants will engage in the process of designing a Maker project for a K-12 academic topic of their choice. Activities include browsing our IdeaBank of adaptable projects, reviewing physical samples of student-made projects, and trying out our methodology to design and plan a Maker project for a core academic class.

We will share resources that illustrate the many forms that a Makerspace/Innovation Lab can take in a K-12 environment, and guides for setting up and operating a successful school Makerspace.

**The Education Arcade**  
Prof. Eric Klopfer and Emily Martin  
Media Lab

Hands on Learning session participants will use mobile phones/devices to play a game that’s in development at The Education Arcade. The game introduces players to population dynamics, marine ecology, and a basic concept for understanding complex systems: one player’s simple actions can result in complex changes within a system. This is the second game in our lab's suite of updated mobile-device enabled activities called pSims, short for participatory simulations. Each pSim is designed to engage active, inquiry-based learning through students' interactions with the digital simulation, and coordination and discussion with one another. After playing the game, session participants will discuss how this and future games can help kids experiment, explore, and build their understanding of complex systems that are central to many of the most pressing societal challenges.

**DIY Health and Life Sciences Tools**  
Little Devices Lab  
N52 - Third Floor  
Middle Conference 391

Explore transparent and reconfigurable systems for health and life sciences. Learn how a spectrum of every day devices can turn into a respiratory therapeutics, opto-analytical systems, rapid diagnostics and affordable go-anywhere automation gear for bio chemistry. Our research is informed by global health challenges. We respond by creating tools that allow everyone to be a health maker.

**Sail Through Engineering**  
MIT Museum  
Building N52, 265 Massachusetts Ave

Learn about the engineering design process by building and testing your own model boat. Participants will use modern technologies, such as computer-aided-design and laser cutting, and explore the methods that Nathanael Herreshoff used to design and build over 2000 boats, including five America's Cup winning yachts, at the turn of the 20th century.
3:30 pm - 4:00 pm
Innovation Showcase Pitches
Samberg Conference Center
Salon M, 7th Floor

4:00 pm - 5:00 pm
Innovation Showcase Showroom
Samberg Conference Center
Dining Rooms 3+4, 6th Floor

The showcase is an open house for J-WEL members and guests to learn about the variety of educational initiatives and projects that take place at MIT as well as a select group of high-potential startups innovating in the field of education. Each organization will give a one-minute spoken pitch to the audience introducing their service or product, with Q&A, demonstrations, and discussion taking place at individual tables.

Day 2 - Tuesday, April 2, 2019

Track 1 - Learning Science and Online Learning
MIT Media Lab, E14 - 6th Floor

9:00 am
Engaging MIT faculty and groups through J-WEL grants
Prof. Haynes Miller, Dept of Mathematics
Dr. Yoon Jeon Kim, Playful Journey Lab, Office of Open Learning
Shruti Dhariwal, Lifelong Kindergarten Group, MIT Media Lab
Prof. Jeff Ravel, Department of History & Rabi Karmacharya (OLE Nepal)
Moderator: Prof. Eric Klopfer

This session will provide an opportunity for MIT faculty and researchers to share their work with the J-WEL community. The goal is to engage with the participants in a conversation about collaboration and ways in which the work can be extended to the J-WEL members.

Making Learning Visible Beyond Engagement through Embedded Assessment in Informal STEM Learning Experiences
Dr. Yoon Jeon Kim
Leveraging Beyond Rubrics—an NSF funded research project that envisions a new form of embedded assessment in hands-on maker curriculum in schools—we propose to address the assessment needs in hands-on project-based learning during two informal learning contexts: the MIT Hong Kong STEAM Camp and i2 Summer learning sessions.

Computational Fluency in Context: Empowering Educators to Support Personally and Culturally Meaningful Creative Coding Experiences
Prof. Mitch Resnick, Dr. Natalie Rusk, Shruti Dhariwal
Through this project, the research team from the Lifelong Kindergarten group at MIT Media Lab will develop creative workshops and remixable learning resources that educators can adapt to
support computational fluency with Scratch in ways that resonate with learners’ culture, surroundings, and interests. The resources will be co-designed with partners at research sites internationally and shared through J-WEL and other global educator networks.

**Learning Games for Middle School Math and Science in Nepal, and Beyond**

Prof. Jeff Ravel & Rabi Karmacharya (OLE Nepal)

The MIT-Nepal Initiative, MIT instructors Eric Klopfer and Philip Tan, the OLE Nepal group founded by Rabi Karmacharya ’97, and the Bloom Nepal School directed by Ram K Rijal ’12 will work together to create games that teach math and science fundamentals to students in grades 6-8 in Nepal.

**A Haitian Center for Educational Innovation**

Prof. Michel Anne-Frederic DeGraff & Prof. Haynes Miller

Answering a demand for Kreyòl-based education material, we will establish a web-based Center, with the aim of soliciting and curating contributions of many sorts, starting with the Kreyòl material we have produced under the MIT-Haiti Initiative.

**11:00 am**

**Online Learning at Scale**

Dana Doyle, Director, MITx Program

In this session we will explore what MITx has learned about online learning at scale. The challenges in engaging learners and experiments some of our course teams have tried in order to cultivate engagement. This will include using forums outside of the edX platform, using unhangouts and encouraging learners to form their own groups.

**1:30 pm**

**Experiential Learning in STEAM Education**

Ed Moriarty

Location: 4-408

Traditional education usually follows a format that presents theory, the mathematical models describing a phenomenon, then exercises the students ability to analyze examples relating to the topic, and eventually leads to answering questions on a test. This may be an efficient way to transfer information about previous scientific work, but it is not providing them with authentic scientific experience. It doesn’t provide an authentic opportunity for students to play with (explore) natural phenomena, without preconceived interpretation … to share perspectives with others, to be curious, perplexed, to wonder, and to share the interesting puzzle with others… to share the joy of discovering a previously unknown pattern in our magical world.

Good hands-on-activities allow participants to experience phenomena with their own senses, sparking curiosity and wonder… setting the stage for conversation, sharing of perspectives, and observations… setting the stage for deep scientific inquiry, or engineering design, or artistic interpretation… encouraging students to wonder, to imagine, and to investigate. The class then becomes a venue for pursuing deeper insight into the phenomena, applying analytical, or experimental tools, or engineering design principles. The techniques range from in-class demonstrations to small in-class group projects, to actual workshops where students design and construct complex projects. The result draws students into the true nature of
science, and develops in them a passion for the topic, and a desire for deeper understanding, making
them much more receptive to formal presentation of theory.

This workshop will allow participants to engage in a range of activities. We will have available many
in-class activities that focus on a range of topics including thermodynamics, photovoltaics, acoustics,
spectroscopy, chemistry, newtonian mechanics, electronics, music theory, communications technology,
and algorithmic thinking. We will choose a couple and provide typical classroom experiences. We will
also have materials to do small group projects. We hope to have a video-conference with teachers, who
have recently run larger workshops in their schools, to allow them to share their experiences and describe
the transformational impact on their students.

3:30 pm
Applying Learning Sciences to Learning Experiences
Dr. Aaron Kessler, Senior Learning Scientist, MIT Open Learning

This session will provide an overview of concepts from the Learning Sciences that are, or can be, part of
instructional strategies and learning experiences. Participants will engage in activities designed to explore
and develop educational interventions that leverage these concepts in their own unique contexts.
Throughout the session participants will be exposed to research on how people learn. Concepts that will
tentatively be covered include Retrieval, Spaced and Interleaved Practice, and Cognitive Load of Working
Memory.

Track 2 - Compassionate Systems Framework
Location: Samberg Conference Center, 6th Floor - Dining Room 4
Times: 9:00 - 10:30 am, 11:00 am - 12:30 pm, 1:30 - 3:00 pm and 3:30 pm - 5:00 pm

Compassionate System Framework
Dr. Mette Böll

During this April's J-WEL week, we will take the opportunity to dive into two particular themes of the
compassionate systems framework: wellbeing and leadership. We will work hands-on with various tools
and practices to cultivate a greater sense of wellbeing for oneself and with others and how that creates a
foundation for how people work together in truly creative and generative ways. We will look at the
scientific underpinnings of wellbeing and tie this to several decades of experience within personal mastery
and the organizational learning perspective that have been a core leadership approach at MIT for
decades. The two days are primarily for participants who have been through an introductory program in
compassionate systems, but there will be plenty to explore for people who are new to the work as well.
Peter Senge will join remotely every day and serve as a reflective partner for the process.

Track 3 - STEAM for Educators
Location: Pappalardo Room, Building 4, Room 349 (4-349) and MIT Media Lab, E14 - 6th Floor

9:00 - 10:30 am and 11:00 - 12:30 pm
Playing with and Playtesting Modules
Joe Diaz
Using modules that have been developed for the MIT STEAM Camp, educators will have the opportunity to get an introduction to the process by which they are developed as well as consider the ways in which they would be able to tweak and remix activities to either better suit the needs of their students or reflect the environment in which they teach. Participants will also be able to experience the module in the eyes of these students as we playtest the activities in actual classrooms.

1:30 - 3:00 pm
Innovation in Education
David Birnbach, Lecturer, Action Learning - MIT Sloan

Accelerating teacher-led innovation in middle and high schools is a task that requires patience and communication. We will be covering how to share a practical change management framework developed at MIT, and show how it can be incorporated to help innovations and new initiatives (e.g. multidisciplinary learning) succeed in the classroom. This will also introduce a new project-based learning assessment rubric developed at MIT that teachers can use to track and measure student progress throughout student-led project lifecycles.

Finally, we will discuss ways to incorporate time in the school calendar dedicated to authentic active learning and show examples.

3:30 - 5:00 pm in E14-6th Floor
Applying Learning Sciences to Learning Experiences
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Day 3 – Wednesday, April 3, 2019

Track 1 - Learning Science and Online Learning
Location: MIT Media Lab, E14 - 6th Floor

9:00 am
CEO of Your Career
Sanjay Sarma

9:45 am
What Big Data Can and Cannot Do
Prof. Devavrat Shah

11:00 - 12:30 pm
Consultation Session
The session is designed to provide practical feedback to J-WEL members about their work and challenges they are facing. We will have three topics during this session.

**Early Childhood Education**

Guests: Wadah Foundation & Queensland University of Technology

MIT:
- Prof. Angela Belcher, Professor, Biological Eng and Mat'l Sci & Eng. Co-faculty director - J-WEL
- Dr. Jim Gray, Research Scientist & Learning Lead - Laboratory for Social Machines (LSM) at Media Lab
- Eliza Berg, Learning Community Office - MIT Solve
- Maria Martinez Calazans Rodrigues, Graduate student - MIT Sloan, Movimento pela Infancia
- Elisa de Rooij Mansur, Graduate student - MIT Sloan, Movimento pela Infancia

**Online and Blended learning**

Guest: Davidson Academy

MIT:
- Steve Caron, Associate Director for Membership - J-WEL
- Dr. Daniel Seaton, Senior Learning Systems Designer - Office of Open Learning
- Joel Grimm, Beaver Works Summer Institute, MIT Lincoln Lab
- Elizabeth Huttner-Loan, Senior Manager, Online Course Development - MIT
- Abby Machson-Carter, instructional designer, MIT
- TBD, Bootcamps

**STE(A)M Learning**

Guest: Unilab Foundation

MIT:
- Prof. Eric Klopfer, Director of the Scheller Teacher Education Program and The Education Arcade. Co-faculty director - J-WEL
- Prof. Richard Larson, MIT BLOSSOMS Initiative
- Dr. Claudia Urrea, Associate Director for pK-12 - J-WEL
- David Birnbach, Lecturer - MIT Sloan School of Management
- Ian Concannon, i2 Learning
- Marla Chae, Life Sciences Teacher - STEAM Innovation Program

1:30 - 2:15 pm

**Global Teaching Labs**

Matt Burt

MISTI Global Teaching Labs (GTL) gives MIT students the opportunity to learn through teaching while sharing MIT's unique approach to education with partner high schools around the world.

GTL is a high impact program. Returning MIT students report excellent experiences and a greater self-confidence stemming from a deeper understanding of the subjects they taught and new ease with cultural differences. Host schools relish the first hand exposure to MIT's Mens et Manus culture and access to online learning materials.
2:15 - 3:00 pm and 3:30 - 5:00 pm
Launching Innovation in Schools
Prof. Justin Reich, Assistant Professor of Comparative Media Studies/Writing

New initiatives often take root in pockets in schools and systems. A new curriculum, program, or professional development approach will come to life first in one department, school, or other part of a system. Often, change stays locked within these pockets of excellence, and its much more rate for new efforts to lead to scaled, systemic change. What happens in the schools and systems where new ideas are able to spread widely, and teaching and learning are marked by ongoing, continuous improvement? In this session, Justin Reich will describe the characteristics of systems that get good at getting better, drawing on material from his MITx course with Peter Senge, Launching Innovation in Schools.

Track 2 - Compassionate Systems Framework
Locations: MIT Media Lab, E14 - 6th Floor and Stratton Student Center, W20-201 (West Lounge)

9:00 - 10:30 am
MIT Media Lab, E14 - 6th Floor

9:00 am
CEO of Your Career
Sanjay Sarma

9:45 am
What Big Data Can and Cannot Do
Prof. Devavrat Shah

11:00 am - 5:00 pm
Location: Stratton Student Center, W20-201

Compassionate System Framework
Dr. Mette Böll

During this April’s J-WEL week, we will take the opportunity to dive into two particular themes of the compassionate systems framework: wellbeing and leadership. We will work hands-on with various tools and practices to cultivate a greater sense of wellbeing for oneself and with others and how that creates a foundation for how people work together in truly creative and generative ways. We will look at the scientific underpinnings of wellbeing and tie this to several decades of experience within personal mastery and the organizational learning perspective that have been a core leadership approach at MIT for decades. The two days are primarily for participants who have been through an introductory program in compassionate systems, but there will be plenty to explore for people who are new to the work as well. Peter Senge will join remotely every day and serve as a reflective partner for the process.

Track 3 - STEAM for Educators
Location: Offsite and MIT Media Lab, E14-2-240

9:00 - 12:30 pm
1:30 pm  
**Reimagining Curriculum**  
Kristina Heavey, Program Manager, Scheller Teacher Education Program

Inquiry learning is a type of active learning where students become the drivers of their learning. Teachers prioritize student questions and ideas and give students the space to explore the topic individually or in small groups. Students are asked to use evidence-based reasoning and creative problem-solving to reach a conclusion or provide a solution to the question that they originally posed. From the teacher perspective, this style of learning helps improve student engagement, and teaches student critical thinking and understanding skills. During this session, you will learn how to reimagine your curriculum to help your students become the drivers of their learning.

3:30 pm  
**Playful Assessment: How to Foster Fun in Authentic Assessments**  
Dr. YJ Kim, Director, MIT Playful Journey Lab - MIT Open Learning

Many educational innovations aim to provide creative, playful, and authentic learning experiences with the goal of supporting deeper learning of skills and mindsets (e.g. creativity, design thinking) that are critical to prepare future generations for the competitive global economy. YJ Kim, a leading researcher in the field of assessment science, and her team have been applying the best practices of game-based learning and alternative assessment to create playful assessments and design tools that educators can use to reimagine classroom assessment that is fun, student-centered, and authentic. For this interactive workshop, the team invites educators and researchers to take a playful assessment approach for redesigning (or designing) their assessment practices and tools. Participants will first experience a few working examples of playful assessment, then groups will generate playful assessment ideas to collect useful information about what learners are developing while fully engaging them in the process of learning and assessment.
Day 4 – Thursday, October 25, 2018
Location: MIT Media Lab, E14-6th Floor

8:45 am
Group Work
pK-12 @ J-WEL and J-WEL Members

10:30 am
Looking at the Future
pK-12 @ J-WEL and Dr. Vijay Kumar

12:00 pm - J-WEL Week Ends