Kids' Tech University

2012 Program at Virginia Tech

January 28, 2012
with Dr. Suzanne Weekes

"How Can Mathematics and Computers Help Us Understand Why Cancer Cells Misbehave?"

KTU Kids' Tech University

I am THE FUTURE OF SCIENCE

Virginia Bioinformatics Institute | Virginia Tech

Virginia Tech — Invent the Future®

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Your generous support helps to make Kids' Tech University possible!

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Volunteers

Many members from the Virginia Tech and Blacksburg community

Additional Support is always welcomed. If you would like to help us provide this exciting opportunity for children, please contact:

Dr. Kristy Collins
540-231-1389
kdivitto@vbi.vt.edu

About the Program

The primary goal of Kids' Tech University (KTU) is to help grow the future workforce in **science, technology, engineering,** and **mathematics** (STEM) by sparking kids' interest in these disciplines.

KTU's curriculum features three parts:

Interactive Sessions
- where children meet scientists and learn about their research

Hands-On Activities
- that give children the opportunity to learn about research projects across the VT campus and beyond

Online Virtual Labs
- which allow continued exploration of science topics at home.
- http://ktu.vbi.vt.edu/

Jan 28th Agenda

9:45 AM

Parents drop off their children for the **interactive session** in McBryde Hall 100

10:30 AM - 12:00 PM

Kids enjoy an interactive session led by Dr. Suzanne Weekes titled **"How Can Mathematics and Computers Help Us Understand Why Cancer Cells Misbehave?"** in McBryde Hall 100

Parents are invited to view the event in a satellite location, over a live video feed, in Torgersen Hall 2150

12:00 PM

Parents pickup their children and kids receive a Hokie Passport lunch card containing $6.00 for **lunch** at one of the specified dining halls on campus, along with 2 preprinted sticky labels. These labels will be used to sign in to the afternoon hands-on activities.

1:10 - 4:00 PM

For the Jan 28th **hands-on activities,** we are splitting up the program participants into two groups decided by the first letter of each child's last name. Each "group" will report to an assigned venue and then (after a time limit) the two groups will switch locations.

Table of Contents

VirginiaTech

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Blacksburg, Virginia 24061
(540) 231-3205 Fax: (540) 231-5750
E-mail: jdooley@vt.edu www.outreach.vt.edu

January 2012

Parents and Participants of Kids' Tech University:

Welcome to the Virginia Tech campus and to Kids' Tech University!

Kids' Tech University, with informative lectures and exciting hands on events, is designed to ignite an interest in Science, Technology, Engineering and Mathematics (STEM) disciplines for you and your child. We are currently in our fourth year of offering the Kids' Tech University program through the coordination of Virginia Bioinformatics Institute (VBI) and Virginia 4-H and the leadership of Dr. Kristy Collins, Dr. Reinhard Laubenbacher and Dr. Kathleen Jamison.

Virginia Tech has a strong commitment to connecting national prominence in research and discovery to advance quality STEM programs across the Commonwealth. Kids' Tech University is just one example of this commitment.

As Vice President for Outreach and International Affairs, I am pleased to welcome you to such a successful program hope you and your child leave with great excitement and interest in the disciplines of Science, Technology, Engineering and Mathematics.

Sincerely,

John E. Dooley, Ph.D.
Vice President for Outreach and International Affairs

/kr

Dr. Suzanne Weekes

Jan 28, 2012 | Interactive Session

"How Can Mathematics and Computers Help Us Understand Why Cancer Cells Misbehave?"

Computers have become faster, better, and stronger over the last few decades. Now, put a mathematician together with these supercomputers and things get even better! In this presentation, we will show what mathematicians do outside the classroom and lecture hall to help us understand how cancers develop, interact, evolve and how we can fight them. We can model tumor development by considering simple models of individual tumor cells that live and interact with each other. Each of our model cells obeys prescribed rules for moving around, dividing in two, and dying.

Starting with a group of cells, what happens when we push "play" and let them interact? What happens when we change the rules? Is there a big effect on what we see? Can we simulate what's going on in a full size tumor on our laptop? How do we include chemicals and toxins that influence the decisions that the cells make in our model? We'll see some of the many cool things mathematicians can do to help improve our lives.

Dr. Suzanne L. Weekes is an Associate Professor and Associate Head of Mathematical Sciences at Worcester Polytechnic Institute (WPI). In addition, she is the director for the Center for Industrial Mathematics and Statistics http://www.wpi.edu/+CIMS at WPI and runs the Research Experience for Undergraduates Program in Industrial Mathematics and Statistics http://www.wpi.edu/+CIMS/REU there. Professor Weekes is also a co-director of the MSRI-UP program http://www.msri.org/up in Berkeley, California. Her research interests are in numerical methods for differential equations and industrial mathematics.

Hands-on Activities

Instructions

Please note that this date will be different than the other dates in the program to come. For this date we are splitting up the program into two groups by first letter of the child's last name **("A-L" and "M-Z" group)**. Each group will report to a different venue and then switch. ***You are responsible for bringing your children to the hands-on activities.***

IF YOUR CHILD'S LAST NAME STARTS WITH A-L:

1:10 PM Drop off child at the Math Emporium in the University Mall; Look for a sign corresponding to the child's last name and sign them in with a volunteer (i.e. give the volunteer one of your preprinted sticky labels).
1:30-2:30 PM Children will be in the Math Emporium taking part in an online activity.
2:30 PM Pick up child; go back to the sign where you dropped them off…you will pick them up here
2:50 PM Go to the VCOM Conference Center in the Corporate Research Center. Look for sign corresponding to your child's last name; sign in your child to a volunteer (i.e. give the volunteer one of your preprinted sticky labels). The children will be doing an activity in the conference center. Dr. Reinhard Laubenbacher will be in an adjacent room talking to the parents.
3:00-4:00 PM Children will be in the VCOM Conference Center; parents will be in lecture space adjoining the center.
4:00 PM Pick up child; go back to the sign where you dropped them off…you will pick them up here

IF YOUR CHILD'S LAST NAME STARTS WITH M-Z:

1:10 PM Go to the VCOM Conference Center in the Corporate Research Center. Look for sign corresponding to your child's last name; sign in your child to a volunteer (i.e. give the volunteer one of your preprinted sticky labels). The children will be doing an activity in the conference center. Dr. Reinhard Laubenbacher will be in an adjacent room talking to the parents.
1:30-2:30 PM Children will be in the VCOM Conference Center; parents will be in lecture space adjoining the center.
2:30 PM Pick up child; go back to the sign where you dropped them off…you will pick them up here
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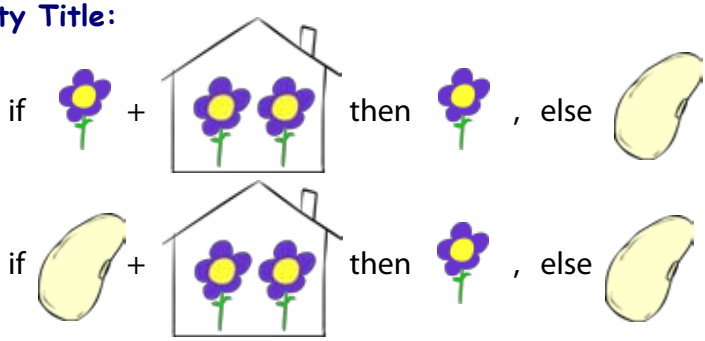
Hands-on Activities

Activity Title:



AT THE VCOM CONFERENCE CENTER IN THE VIRGINIA TECH CORPORATE RESEARCH CENTER (CRC)

- Ants do it, bees do it, and we can too. It's time to pretend we are independent cellular automata, with pre-programmed rules. Start us up, and see what happens.

- Dr. Reinhard Laubenbacher will be in an adjacent room giving a presentation to the parents:
  Lecture and Question & Answer session on: Math and Science in Our Everyday Lives

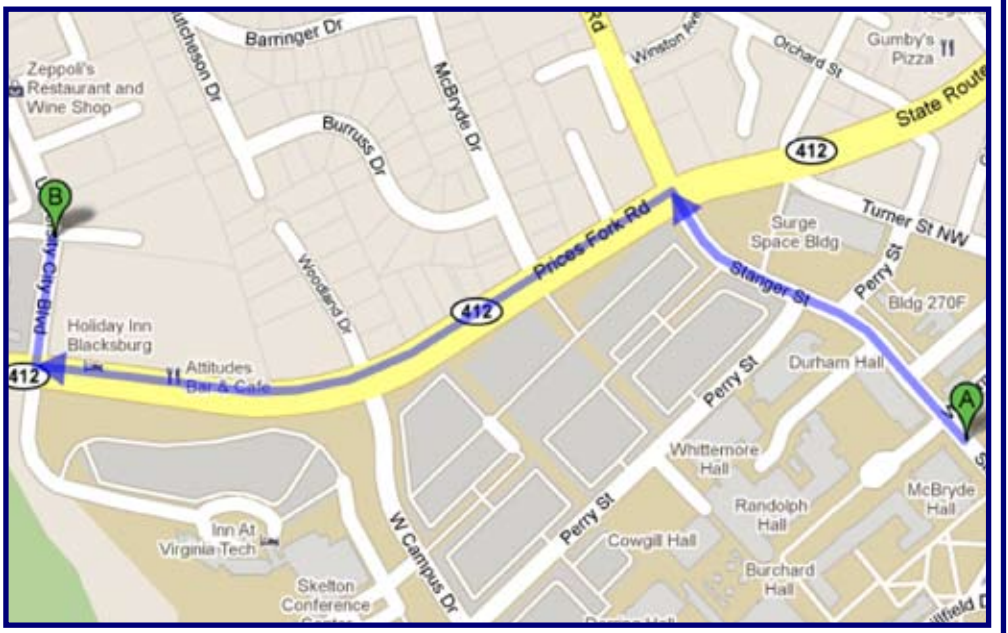
Activity Title: "Hunting for Patterns"

AT THE MATH EMPORIUM IN THE UNIVERSITY MALL

- What just happened? How to build your intuition for emergent behaviors, just like mathematicians. If they can do it, so can you!

Hands-on Activities - Locations

Driving directions from McBryde Hall to the Math Emporium



FROM GOOGLE MAPS

START FROM

McBryde Hall
Blacksburg, VA 24060

1 - Head northwest on Stanger St toward Prices Fork Rd (ABOUT 0.3 MILES)

2 - Turn left at Prices Fork Rd/ State Route 685 (ABOUT 0.5 MILES)

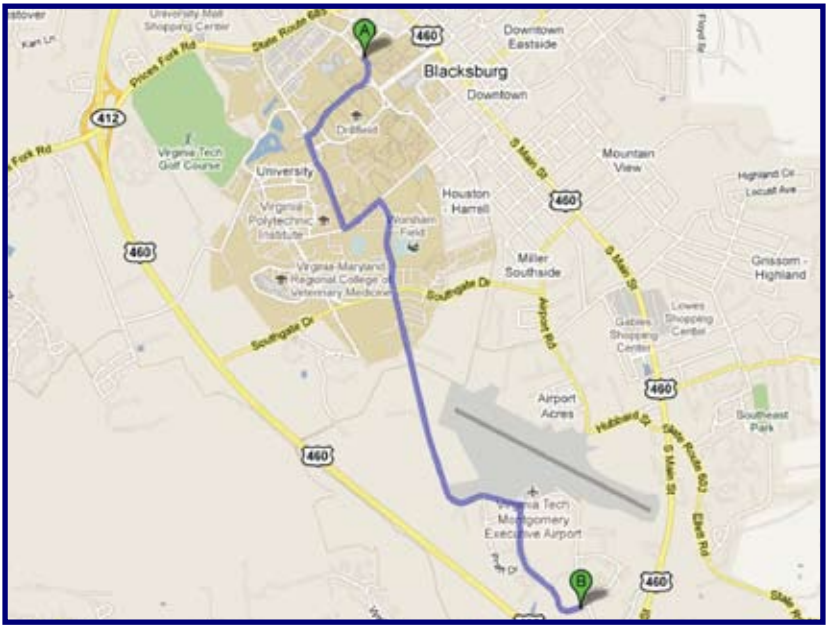
3 - Turn right at University City Blvd (ABOUT 400 FEET)
The Math Emporium is on the left, in the shopping area/mall.
Parking can be found in the parking garage.

END AT

Virginia Tech Math Emporium
University Mall
801 University City Blvd
Blacksburg, VA 24060
LATITUDE & LONGITUDE: 37.2337,-80.4342

Hands-on Activities - Locations

Driving directions from McBryde Hall to the VCOM conference center



FROM GOOGLE MAPS

START FROM

McBryde Hall
Blacksburg, VA 24060

1 - Head southeast on Stanger St toward Drillfield Dr (ABOUT 0.1 MILES)

2 - Slight right at Drillfield Dr (ABOUT 0.2 MILES)

3 - Slight right toward W Campus Dr (ABOUT 381 FEET)

4 - Turn left at W Campus Dr (ABOUT 0.4 MILES)

5 - Turn left at Washington St SW (this turn is a traffic circle) (ABOUT 0.2 MILES)

6 - Turn right at Spring Rd (ABOUT 0.4 MILES)

7 - Continue onto Tech Center Dr (ABOUT 1.2 MILES)

8 - Turn right at Kraft Dr (ABOUT 0.6 MILES)

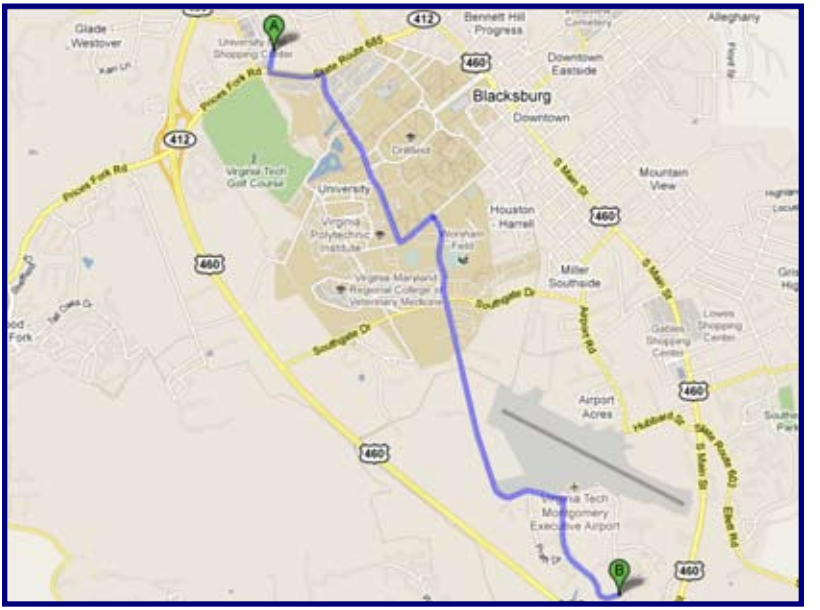
END AT

2280 Kraft Dr
Blacksburg, VA 24060

LATITUDE & LONGITUDE: 37.1989024,-80.4055688

Hands-on Activities - Locations

Driving directions from the Math Emporium to VCOM conference center



from Google Maps

Start from

Virginia Tech Math Emporium
University Mall
801 University City Blvd
Blacksburg, VA 24060
latitude & longitude: 37.2337,-80.4342

1 - Head south on University City Blvd toward Prices Fork Rd/State Route 685 (about 400 feet)

2 - Take left onto Prices Fork Rd/State Route 685 (about 0.2 miles)

3 - Take the 1st right onto W Campus Dr (about 0.8 miles)

4 - Turn left at Washington St SW (this turn is a traffic circle) (about 0.2 miles)

5 - Turn right at Spring Rd (about 0.4 miles)

6 - Continue onto Tech Center Dr (about 1.2 miles)

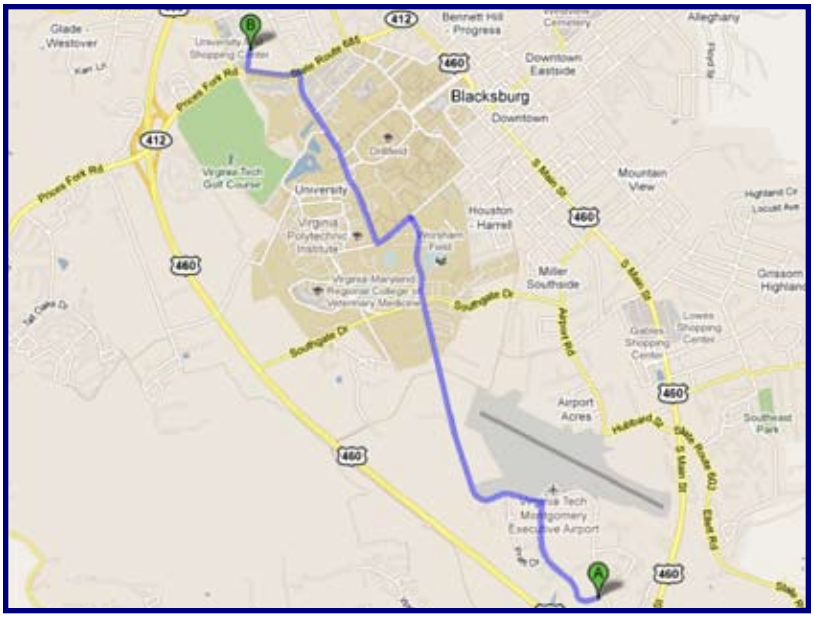
7 - Turn right at Kraft Dr (about 0.6 miles)

End at

2280 Kraft Dr
Blacksburg, VA 24060
latitude & longitude: 37.1989024,-80.4055688

Hands-on Activities - Locations

Driving directions from VCOM conference center to the Math Emporium



from Google Maps

Start from

2280 Kraft Dr
Blacksburg, VA 24060
latitude & longitude: 37.1989024,-80.4055688

1 - Head west on Kraft Dr toward Pratt Dr (about 0.6 miles)

2 - Turn left at Tech Center Dr (about 1.2 miles)

3 - Continue onto Spring Rd (about 0.4 miles)

4 - Turn left at Washington St SW (about 0.2 miles)

5 - Turn right at W Campus Dr (this turn is a traffic circle) (about 0.8 miles)

6 - Turn left at Prices Fork Rd/ State Route 685 (about 0.2 miles)

7 - Take 1st right onto University City Blvd (about 400 feet)
The Math Emporium is on the left, in the shopping area/mall.
Parking can be found in the parking garage.

End at

Virginia Tech Math Emporium
University Mall
801 University City Blvd
Blacksburg, VA 24060
latitude & longitude: 37.2337,-80.4342

Educator Workshops

We are excited to offer CEU (Continuing Education Unit) credits for educators in conjunction with the KTU program.
Educators will learn it, teach it, and take it back to the classroom.

Interact with:
- **S**cientists
- **T**echnology Experts
- **E**ngineers
- **M**athematicians

You will engage in an exciting, hands-on teaching experience, and then apply what you learned in a unique, first-hand teaching environment with 3rd-6th graders. You will also be able to participate in ongoing community blogs and network with other teachers and education specialists.

This program is ideal for elementary and middle school teachers, out of school time educators, or others interested in STEM teaching.

Educator Workshop

- interact with Scientists, Technology Experts, Engineers, and Mathematicians
- participate in a four (4) hour interactive hands-on training
- interact with KTU students at learning stations to deploy what you learned
- be an audience member in a topic session with kids, led by a world renowned research scientist
- learn how to incorporate fundamentals and concepts from the interactive session and training into your classrooms

Any educator who has a child enrolled in Kids' Tech University and who is attending the teacher workshop will need to arrange for a chaperone to accompany their child during the program. Children are not permitted to attend the educator workshop (regardless of age)

Cost

Virginia 4-H is paying the registration fee for the first 10 participants for each workshop. Register early to hold your spot for February, March, and April! The cost per workshop is $30. However, if there is a hardship please let us know by emailing, Dr. Kristy Collins at kdivitto@vbi.vt.edu.

January KTU Educator Workshop

The workshops will be held on the Virginia Tech campus in Blacksburg, Virginia.

"Interactive Session: How can mathematics and computers help us understand why cancer cells misbehave?"

Workshop instructor: Dr. Kathleen Jamison, Virginia 4-H;
Guest Researcher: Dr. Suzanne Weekes

Jan. 28, 2012, 8 am-5 pm
CEU credits offered

Have you ever heard that math is the universal language? That it is constant and can define the world around us? In this workshop educators will learn about the math concepts that are applicable to the health field and various online learning tools that may be brought into the classroom.

Registration

The registration deadline is one (1) week before the scheduled educator workshop. The class/workshops can be taken as a series or individually.

Please visit
http://kidstechuniversity.vbi.vt.edu/
for further information, and to register for the next KTU Educator Workshop.

KTU is a program at Virginia Tech with one primary goal: creating the future workforce in

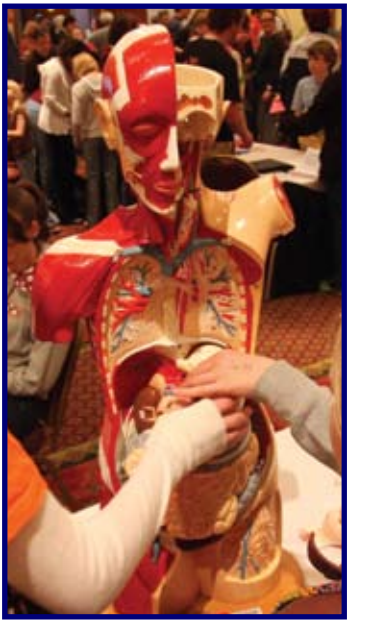
Science,

Technology,

Engineering,

and **Mathematics**

by sparking kids' interest in these fields.



KTU 2012 Program Dates

Jan 28 | Math Day
Feb 25 | Technology Day
Mar 24 | Engineering & Health Centric Day
Apr 07 | Science Day

Contact

Dr. Reinhard Laubenbacher
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Dr. Kristy Collins
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kdivitto@vbi.vt.edu

VIRGINIA BIOINFORMATICS INSTITUTE VBI

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We look forward to seeing you in February!