

IBL & Mathematical Puzzlehunt Competitions

Legacy of R.L.M. Conference - 2015

Steven Clontz¹ PJ Couch²

¹Auburn, AL

²Lamar University

June 27, 2015

A **puzzlehunt** is a type of scavenger hunt which replaces the list of items to collect with a list of puzzles to solve.

EPP15: Eric's Circle of Friends (image of kissing circles)

EPP15: Eric's Circle of Friends (image of solutions plotted on a map)

Famous puzzlehunts include:

- MIT Mystery Hunt
- Microsoft College Puzzle Challenge
- DASH (Different Area Same Hunt)
- Various “room escape” challenges

Some puzzlehunts are organized by communities of puzzle solvers, and others are sponsored by companies.

Businesses use puzzles in interviews to determine if future employees are able to problem-solve.

Famous puzzlehunts include:

- MIT Mystery Hunt
- Microsoft College Puzzle Challenge
- DASH (Different Area Same Hunt)
- Various “room escape” challenges

Some puzzlehunts are organized by communities of puzzle solvers, and others are sponsored by companies.

Businesses use puzzles in interviews to determine if future employees are able to problem-solve.

Famous puzzlehunts include:

- MIT Mystery Hunt
- Microsoft College Puzzle Challenge
- DASH (Different Area Same Hunt)
- Various “room escape” challenges

Some puzzlehunts are organized by communities of puzzle solvers, and others are sponsored by companies.

Businesses use puzzles in interviews to determine if future employees are able to problem-solve.

Solving well-designed IBL coursenotes and puzzles are very similar processes:

- The solution is (often) not algorithmic.
- Everything is on the page for a reason.
- Solutions are leading somewhere.

Solving well-designed IBL coursenotes and puzzles are very similar processes:

- The solution is (often) not algorithmic.
- Everything is on the page for a reason.
- Solutions are leading somewhere.

Solving well-designed IBL coursenotes and puzzles are very similar processes:

- The solution is (often) not algorithmic.
- Everything is on the page for a reason.
- Solutions are leading somewhere.

Solving well-designed IBL coursenotes and puzzles are very similar processes:

- The solution is (often) not algorithmic.
- Everything is on the page for a reason.
- Solutions are leading somewhere.

Many players report added satisfaction with a puzzle if they feel like they learned something new along the way.

Likewise, mathematical challenges should be designed like puzzles: to be solved, not to confound.

Many players report added satisfaction with a puzzle if they feel like they learned something new along the way.

Likewise, mathematical challenges should be designed like puzzles: to be solved, not to confound.

Posing team-based math puzzles support the Common Core Standards for Mathematical Practice.

- Model with mathematics.
- Make sense of problems and persevere in solving them.
- Construct viable arguments and critique the reasoning of others.
- Etc... <http://www.corestandards.org/Math/Practice/>

Posing team-based math puzzles support the Common Core Standards for Mathematical Practice.

- Model with mathematics.
- Make sense of problems and persevere in solving them.
- Construct viable arguments and critique the reasoning of others.
- Etc... <http://www.corestandards.org/Math/Practice/>

Posing team-based math puzzles support the Common Core Standards for Mathematical Practice.

- Model with mathematics.
- Make sense of problems and persevere in solving them.
- Construct viable arguments and critique the reasoning of others.
- Etc... <http://www.corestandards.org/Math/Practice/>

Posing team-based math puzzles support the Common Core Standards for Mathematical Practice.

- Model with mathematics.
- Make sense of problems and persevere in solving them.
- Construct viable arguments and critique the reasoning of others.
- Etc... <http://www.corestandards.org/Math/Practice/>

Posing team-based math puzzles support the Common Core Standards for Mathematical Practice.

- Model with mathematics.
- Make sense of problems and persevere in solving them.
- Construct viable arguments and critique the reasoning of others.
- Etc... <http://www.corestandards.org/Math/Practice/>

AMP'd (Auburn Mathematical Puzzle) Challenge (est. 2012)

- Adaptation of Australian IBL math camp as single-day middle school competition

Goal: students collaborate as a team to solve puzzles by modeling them with mathematics.

AMP'd (Auburn Mathematical Puzzle) Challenge (est. 2012)

- Adaptation of Australian IBL math camp as single-day middle school competition

Goal: students collaborate as a team to solve puzzles by modeling them with mathematics.

LaMP (Lamar Mathematical Puzzle) Challenge (est. 2015)

- Blend of IBL experience and puzzlehunt

Goal: encourage underrepresented (88% identified as minority) students to reenvision mathematics as a fun problem-solving activity.

Based on the positive responses we received from students and teachers participating in AMP'd and LaMP, our team of mathematicians are organizing Mathematical Puzzle Programs (MaPP) to bring similar unique experiences to even more campuses.

Our first event will be a high school competition similar to LaMP to a half-dozen campuses across the country in 2016.

Based on the positive responses we received from students and teachers participating in AMP'd and LaMP, our team of mathematicians are organizing Mathematical Puzzle Programs (MaPP) to bring similar unique experiences to even more campuses.

Our first event will be a high school competition similar to LaMP to a half-dozen campuses across the country in 2016.

MaPP Format (tentative)

- Opening Puzzle

A physical challenge requiring students to run around a green space to collect data required to solve an otherwise quick puzzle.

- Main Puzzles

Teams receive a packet of mathematical puzzles. Each solution unveils a secret message worth points, and solving the riddle within reveals the hidden location of an EXTRA Puzzle.

MaPP Format (tentative)

- Opening Puzzle

A physical challenge requiring students to run around a green space to collect data required to solve an otherwise quick puzzle.

- Main Puzzles

Teams receive a packet of mathematical puzzles. Each solution unveils a secret message worth points, and solving the riddle within reveals the hidden location of an EXTRA Puzzle.

LaMP Format (cont.)

- EXTRA Puzzles

Extensions to the main puzzles involving optimization.
Teams which submit the best solution earn points.

- Metapuzzle

An undergraduate-level mathematics problem from field underrepresented in HS. Points are awarded based on the generality of the submitted solutions.

LaMP Format (cont.)

- EXTRA Puzzles

Extensions to the main puzzles involving optimization.
Teams which submit the best solution earn points.

- Metapuzzle

An undergraduate-level mathematics problem from field underrepresented in HS. Points are awarded based on the generality of the submitted solutions.

Plans for the future...

- Open source materials for free use in the classroom
- Build web application to manage the game and allow remote teams to participate
- More elaborate manipulative puzzles
- Support regional/national competitions for top teams.

Plans for the future...

- Open source materials for free use in the classroom
- Build web application to manage the game and allow remote teams to participate
- More elaborate manipulative puzzles
- Support regional/national competitions for top teams.

Plans for the future...

- Open source materials for free use in the classroom
- Build web application to manage the game and allow remote teams to participate
- More elaborate manipulative puzzles
- Support regional/national competitions for top teams.

Plans for the future...

- Open source materials for free use in the classroom
- Build web application to manage the game and allow remote teams to participate
- More elaborate manipulative puzzles
- Support regional/national competitions for top teams.

Plans for the future...

- Open source materials for free use in the classroom
- Build web application to manage the game and allow remote teams to participate
- More elaborate manipulative puzzles
- Support regional/national competitions for top teams.

- <http://www.mappmath.org>
- Twitter: @StevenXClontz, @MaPPMath

Questions? Thanks for listening to us!