

## Lesson Plan Session 3

### Problem Solving Practical Session

#### General Aspects:

##### 1. *Learning Goals:*

To develop an understanding of mathematical problem posing in the classroom

To develop problem posing skills

##### 2. *General Strategy:*

Working on 7 main problems, alongside discussion of key concepts

##### 3. *Structure:*

6 lesson segments: an introduction (including a warm up problem, and a discussion of definitions of problem posing), 2 demonstrations and discussions, 2 main problem posing sessions (including, reflection time, small group work and whole group discussion of strategies and lessons learned), and a concluding discussion.

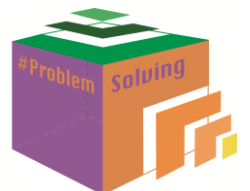
##### 4. *Resources:*

Worksheet, PowerPoint presentation

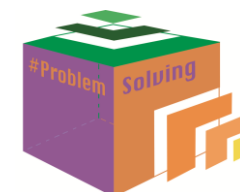
#### Development of the Lesson:



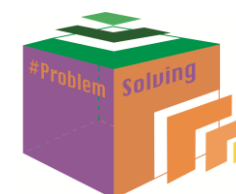
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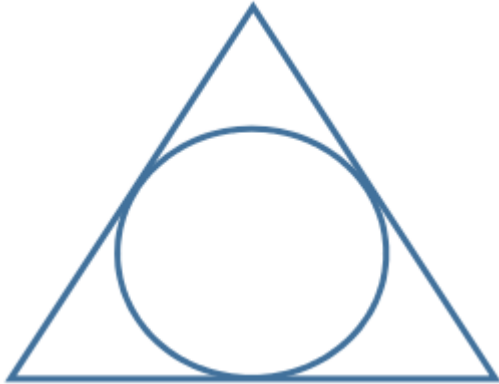


| Task and Learning Activities  | Expected Duration | Class Activity (potential difficulties) | Instructor Support | Goal and Assessment |   |     |    |   |    |         |   |   |   |
|---|-------------------|---|--------------------|---------------------|---|-----|----|---|----|---------|---|---|---|
| <p>Introduction</p> <table border="1" data-bbox="212 419 712 767"> <tr> <td>11</td> <td>2</td> <td>18</td> </tr> <tr> <td>5</td> <td>2</td> <td>???</td> </tr> <tr> <td>12</td> <td>5</td> <td>14</td> </tr> </table> <p>Warm up activity</p> | 11                | 2                                       | 18                 | 5                   | 2 | ??? | 12 | 5 | 14 | 10 mins | <p>Small groups work on solving problem before sharing solutions with group as a whole</p><br><p>Take notes of various definitions provided for problem posing. Possibility for discussion/questions on variety in definitions, own definition?</p> | <p>Allow reflection time before discussion of solution</p><br><p>Explanation and facilitation of group discussion</p> | <p><i>Goal</i></p> <p>To revise key problem solving strategies</p><br><p>To define Problem Posing</p><br><p><i>Assessment</i></p> <p>Peer assessment<br/>Group discussion</p> |
| 11  | 2                 | 18                                      |                    |                     |   |     |    |   |    |         |   |   |   |
| 5   | 2                 | ???                                     |                    |                     |   |     |    |   |    |         |   |   |   |
| 12  | 5                 | 14                                      |                    |                     |   |     |    |   |    |         |   |   |   |

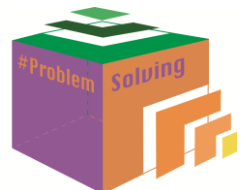


| Discussion: What is Problem Posing?   |         |  |   |   |
|---|---------|--|---|---|
| <p><i>Demonstration and Discussion</i></p> <p>Bloom's taxonomy and the importance of problem posing<br/>           Examples of Problem posing – contexts<br/>           Categories of Problem posing – free, semi-structured, structured<br/>           Issues with Problem Posing</p>  | 15 mins | Take notes on examples, categories etc. Possibility for discussion (particularly regarding further examples of various categories, etc.)   | Explanation and facilitation of group discussion  | <p><i>Goal</i><br/>           To develop an understanding of the nature and importance of problem posing</p> <p><i>Assessment</i><br/>           group discussion</p> |
| <p><i>Problem Posing Tasks 1-6</i></p> <p><i>Write and Solve as many problems as possible using the following information</i></p> <p>1. Julie has 115 marbles, Patrick has 105 marbles and Mary has 220 marbles.</p> <p>2. Nathan, Elizabeth and Megan took turns driving home from a trip. Megan drove 80km more than Elizabeth. Elizabeth drove twice as many km as Nathan. Nathan drove 50km.</p> <p>3. In the diagram, there is an equilateral triangle and its inscribed circle.</p> | 30 mins | <p>Individually, and then in groups of 3 or 4, reflection on problems, pose as many as possible, and then solve (if you can)</p> <p>Share ideas within group</p> <p>At end of segment, share ideas with class as a whole – who came up with similar problems/different, etc.</p> | <p>Allow reflection time, circulate and discuss ideas with groups</p> <p>After 20/25 minutes, facilitate group discussion. Share ideas of both problems posed and strategies used for solving problems.</p> | <p><i>Goal</i><br/>           To improve problem posing skills</p> <p><i>Assessment</i><br/>           Peer assessment<br/>           Group discussion</p>            |

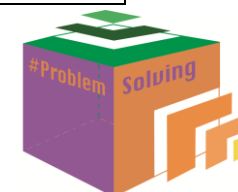




- 4. Speed = 80 km/h. Time = 15 min.
- 5. The answer to a fraction multiplication is  $2\frac{3}{4}$
- 6.



|  |         |  |  |   |
|--|---------|--|--|---|
| <p><i>Demonstration and Discussion</i></p> <p>Maths Eyes Competition Ireland</p> <p>Relevance to the Irish Mathematics Curriculum</p>  | 10 mins | Take notes and discuss the various examples/ideas  | <p>Explain details of competition and discuss examples given</p> <p>Explain relevance to new reformed Junior Cycle assessment in mathematics</p>   | <p><i>Goal</i></p> <p>To develop an understanding of problem posing</p> <p><i>Assessment</i></p> <p>Group discussion</p>  |
| <p><i>Problem Posing Task 7</i></p> <p>In groups of three/four:</p> <ul style="list-style-type: none"> <li>• Pose an original mathematics problem using your 'Maths Eyes' (can take any form – doesn't have to be a picture)</li> <li>• Solve the problem if possible</li> <li>• Interpret any findings in the context of the original problem.</li> <li>• Can the original problem be extended / reformulated?</li> </ul> <p>Short 5-10 minutes presentation of the problem to wider group.</p> | 45 mins | <p>Take note of task and how it can be used in school setting</p> <p>In groups of 3 or 4, set about task</p> <p>Whole group discussion of problems posed</p> | <p>Show example of Maths eyes task as it could be presented to a second year maths class, for example.</p> <p>Allow groups to work for remaining time, posing their own mathematics problem.</p> <p>Facilitate group discussion, showing examples of problems posed throughout session</p> | <p><i>Goal</i></p> <p>To develop an understanding of the nature of problem posing</p> <p>To improve problem posing skills</p> <p><i>Assessment</i></p> <p>Peer assessment, group discussion</p> |
| <p><i>Conclusion</i></p> <p>Final points and allow for questions</p>   | 10 mins | Group discussion/questions on problem posing strategies, ideas for implementation in classroom, etc.   | Facilitate discussion  | <p><i>Goal</i></p> <p>To recap ideas of the day</p>   |



|  |  |  |                                   |  |
|--|--|--|-----------------------------------|--|
|  |  | One thing I learned today<br>One action I will take in my<br>teaching<br>(Fill in via Poll.Ev.com) | Pose questions via<br>Poll.Ev.com | <i>Assessment</i><br>Group discussion<br>Online poll |
|--|--|--|-----------------------------------|--|



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