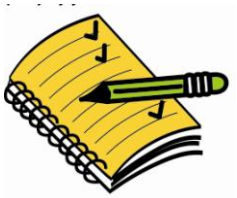
THE TOWER OF LUBLIN

Age group	Secondary School, Grades 1 – 4	
Competency features	Ability to shape ideas into plans and bring them to fruition. 	Ability to accept risk 
Aims	▪ to find one's bearings, assess the set criteria and choose the right solution ▪ to formulate a plan and make it happen ▪ to get experience in tackling a challenging group task ▪ to experience competitive teamwork	
Timing	45 – 60 minutes	
Location	indoors	
Resources & materials	Each team: a paper bag with ca 200 bits of Lego, Worksheets *Plan* and *Profit & Loss*, writing implements, stopwatch, tape measure, small prizes for the winners	

Description

1. Teacher splits the students into groups, ca 4-strong. Each group is to settle down so that they do not disturb the others.
2. Teacher instructs:

   "The goal of this competitive activity is to build the best possible tower that would remain erect for at least one minute, at which time it will be measured up and evaluated.

   There are two tasks you need to tackle:

   First, you will have 25 minutes to design how the tower is going to get build. For it, you will use the Plan worksheet. Apart from that, you will also be given the Profit & Loss worksheet, providing further information for construction. Mind you, by the time your 25 minutes are up, all the building material from the paper bag must be sorted into individual parts (bricks). In case you fail to comply, 5000 points will be deducted from your score, and should you have no plan ready, another 3000 points will be lost.

   Next comes the actual construction of your tower. Remember, it will have to stand for at least one minute, with no external support. Only then will it be measured and evaluated.

You are about to receive your building material, and you must not use anything else for construction. Of course, you will get the worksheets, too.“

3. Before the teacher does so, he needs to make sure everyone is clear on what to do. Once the materials and worksheets are distributed, he does not interfere with the work.
4. Teacher starts counting the first 25 minutes. When the time is up, he checks that all the teams have got a plan and the Lego parts have been sorted into individual bits. Penalties are given for failure to comply with either requirement.
5. Teacher proceeds with the next stage; as teams call in with their construction finished, he marks their time. Making sure the towers stand up for at least a minute, unaided, the teacher measure them up. He informs each team about their results.
6. Towers are assessed against the set criteria, and teams announce their results.
7. Teacher bids members of the teams to silently look back at what they have done, providing about 10 minutes for it before they articulate their thoughts in the open. This culminates in a short discussion when mutual experience is shared, and finally, the winning team gets its award.

Risks and recommendations	Attention needs to be paid to whether all the evaluation criteria have been met, indeed. It may well happen that some are omitted by accident; e.g., exactly 100 construction bricks are used, yet that does not lead to reaching the height of 37½ inches (95,25 cm), and 40 000 points ought to be deducted as penalty.
Feedback	Questions for discussion: Was the task performed as required? Was there any analysis taking place before you started construction? What was the most difficult part? What made your activities easier, and what hindered your efforts? Was there any tension and/or arguments while you worked? Did you assign roles within your team? How could your team have worked even better? Considering what the others have achieved, are you happy with your result? How did your team feel at the beginning, during, and at the end of the exercise? How did you manage success and/or failure? Write up your feelings on the board and have a chat about it. What would you do the same next time round, and what would be different? What of the experience could be used in real life?
Application in classes	technical subjects; economics; maths

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Notes	

Worksheet **PLAN**

Notes

Number of bricks	
Height of tower	
Time	

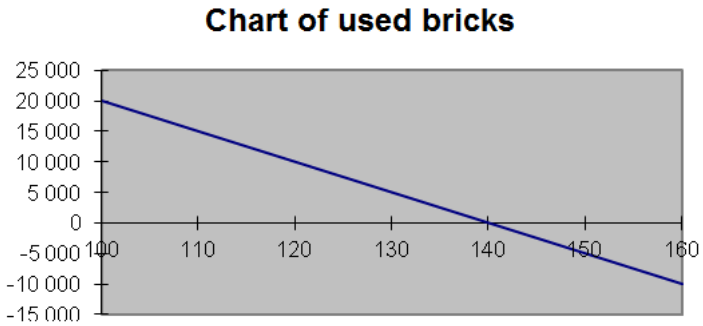
Evaluation

	Data	**Points**
No. of bricks		
Height of tower		
Time		
Deductions		
Total		

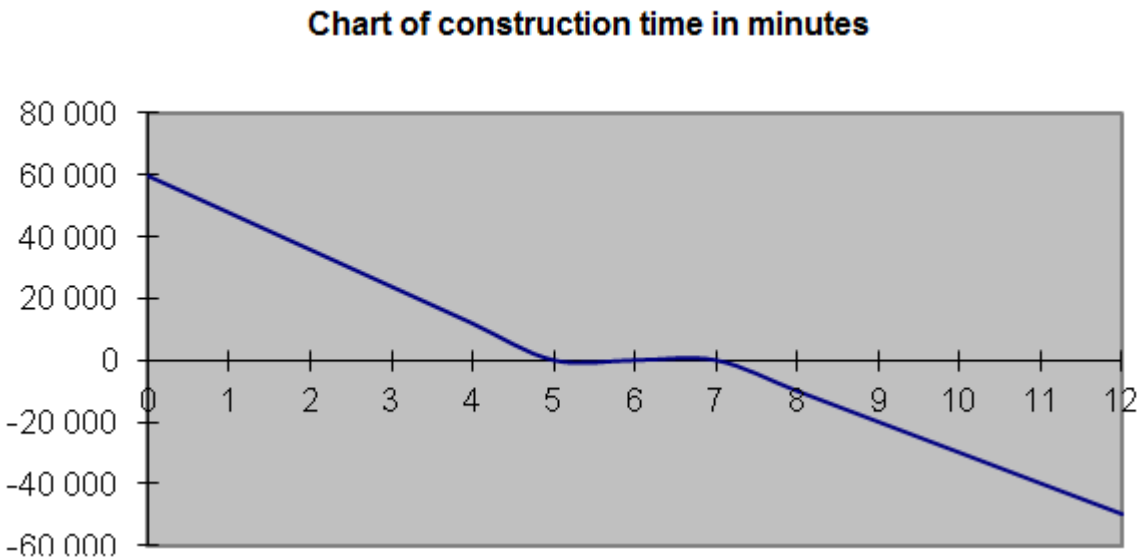
Worksheet: **PROFIT & LOSS**

How to achieve the best value for your tower will become obvious from the three charts below. Study them carefully before you start on your design.

A. Points for bricks used

▪ **Max. gain = 20 000** ▪ **minimum quantity of bricks used = 100** ▪ **penalty for using less than 100 bricks = 20 000**	

B. Time of construction



C. Height of tower

Penalty for not reaching the height of 37½ inches = 40.000

1 inch = 2.54 cm