Statistics Investigation – Movie Critics
IBMYP Year 5 / AC 10 Mathematics

NAME:

Unit Title:	Statistics	Date Released:	*June 2018*
Checkpoint Date:	*	Due Date:	

Statement of Inquiry:

Mathematical models can be used to better understand changes in relationships in our world.

Task Overview

Directed Investigation relating to the Statistics topic covered in class.

Your Task

The purpose of this investigation is to compare demographics of people determine who the best judges of movies are. You have two choices you can investigate (select one):

1. Under 18s or Over 45s
2. Males or Females

Formulate an investigation, research, gather data and perform a statistical analysis on your findings.

Submission: Produce a report on your investigation that includes the information above.

Introduction – What is the aim of the investigation?
Gathering the Data – Include screenshots and/or draw up tables. Explain what you did and why you chose the 3 movies you selected.
Analysis – see below, making sure you include all working out.
Discussion – see below
Conclusion – summarise your findings.

Requirements and Format:	
Word Count /Length	*500-1000 words equiv.*
Format/Text Type	**Directed Investigation**
Components	**Calculations, data acquisition and report.**

Assessment Criteria	Maximum Level
A Knowing and Understanding	**N/A**
B Investigating Patterns	**8**
C Communicating	**8**
D Applying Mathematics in Real-life Contexts	**8**

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MYP Criterion B: Investigating Patterns

Achievement Level	Level descriptor	Clarification
0	The student does not reach a standard described by any of the descriptors given below.	● No attempt made or very little effort shown.
1-2	The student is able to: i. **apply,** with teacher support, mathematical problem-solving techniques to discover simple patterns ii. **state** predictions consistent with patterns.	● Able to locate data and state some basic trends or patterns
3-4	The student is able to: i. **apply** mathematical problem-solving techniques to discover simple patterns ii. **suggest** general rules consistent with findings	● Able to select appropriate data and perform basic statistical analysis such as finding the mean, median and mode. ● Able to make basic explanations and form a basic conclusion
5-6	The student is able to: i. **select** and apply mathematical problem-solving techniques to discover complex patterns ii. **describe** patterns as general rules consistent with findings iii. **verify** the validity of these general rules.	● Able to select appropriate data and perform a full statistical analysis with minimal errors. Explanations and discussions make appropriate links between the data to draw conclusions.
7-8	The student is able to: i. **selec**t and **apply** mathematical problem-solving techniques to discover complex patterns ii. **describe** patterns as general rules consistent with findings iii. **verify** the validity of these general rules.	● Able to select 3 well chosen movies and validate their selection. ● Able to perform a thorough, concise statistical analysis on the data which is at least mostly correct. ● Logical and meaningful links made between explanations, discussion and conclusion, with results used to justify the conclusion..

MYP Criterion C: Communication

Achievement Level	Descriptor	Clarification
0	The student does not reach a standard described by any of the descriptors given below.	● No attempt made or very little effort shown.
1-2	The student is able to: i. **use** limited mathematical language ii. **use** limited forms of mathematical representation to present information iii. **communicate** through lines of reasoning that are difficult to interpret.	● Limited evidence of structure or mathematical reasoning within the report. Little reasoning given to justify decisions and calculations. ● Mathematical language not used or incorrectly used.
3-4	The student is able to: i. **use** some appropriate mathematical language ii. **use** appropriate forms of mathematical representation to present information adequately iii. **communicate** through lines of reasoning that are complete iv. adequately **organise** information using a logical structure.	● The report is well laid out and generally easy to follow. ● Some mathematical language used with partial effectiveness ● Some attempt at explaining the reasons for performing certain calculations. ● Evidence of structure and complete mathematical reasoning within the report.
5-6	The student is able to: i. usually **use** appropriate mathematical language ii. usually **use** appropriate forms of mathematical representation to present information correctly iii. usually move between different forms of mathematical representation iv. **communicate** through lines of reasoning that are complete and coherent v. **present** work that is usually organized using a logical structure	● Generally able to work with and describe the mathematics used for the task. ● A well-structured, accurate and logical report. ● Clear and complete explanations given for why calculations are being performed. ● Able to present sound reasoning to explain trends and discussion of data. ● Mathematical language and terminology used effectively to communicate ideas.
7-8	The student is able to: iii.move between different forms of mathematical representation **iv.communicate** through lines of reasoning that are complete, coherent and concise	● Proficient in describing the mathematics used/ ● High level of mathematical literacy used effectively to communicate results and interpret data. ● Complete and concise reasons given for justifying calculations.

	v.present work that is consistently organized using a logical structure	• Trends, explanations, and discussion are concisely explained with a sufficient depth and detail. • A consistently well-structured accurate and logical report.

MYP Criterion D: Applying Mathematics in Real-Life Contexts

Achievement Level	Descriptor	Clarification
0	The student does not reach a standard described by any of the descriptors given below.	➢ No attempt made or very little effort shown.
1-2	The student is able to: i. **identify** some of the elements of the authentic real-life situation ii. **apply** mathematical strategies to find a solution to the authentic real-life situation, with limited success.	➢ Conclusion is stated, but not justified and tenuously linked to other parts of the investigation ➢ An aim is stated, but may not be appropriate or consistent with the investigation. ➢ Limitations and assumptions may be stated but their understanding may not be communicated clearly.
3-4	The student is able to: i. **identify** the relevant elements of the authentic real-life situation ii. **select,** with some success, adequate mathematical strategies to model the authentic real-life situation iii. **apply** mathematical strategies to reach a solution to the authentic real-life situation iv. **discuss** whether the solution makes sense in the context of the authentic real-life situation.	➢ Generally appropriate mathematical strategies selected and applied with some success. ➢ An appropriate aim is given, but this may differ to the focus displayed in other parts of the report. ➢ A conclusion is stated which may or may not reflect the results. ➢ Limitations and assumptions are stated with some attempt at explaining how they affected the conclusion.
5-6	The student is able to: i. **identify** the relevant elements of the authentic real-life situation ii. **select** adequate mathematical strategies to model the authentic real-life situation iii. **apply** the selected mathematical strategies to reach a valid solution to the authentic real-life situation iv. **explain** the degree of accuracy of the solution v. **explain** whether the solution makes sense in the context of the authentic real-life situation.	➢ Mostly appropriate mathematical strategies selected and applied successfully. ➢ A concise aim is given which is consistent with the work being done in the rest of the investigation. ➢ An appropriate conclusion is given which is correctly reflected by the results of the investigation. ➢ Limitations and assumptions are stated with some attempt at explaining how they affected the conclusion. Some appropriate changes are suggested.
7-8	The student is able to: i. **identify** the relevant elements of the authentic real-life situation ii. **select** appropriate mathematical strategies to model the authentic real-life situation iii. **apply** the selected mathematical strategies to reach a correct solution to the authentic real-life situation iv. **justify** the degree of accuracy of the solution v. **justify** whether the solution makes sense in the context of the authentic real-life situation.	➢ Highly appropriate mathematical strategies selected and applied successfully. ➢ A clear, concise aim is given which is consistent with the work being done in the rest of the investigation. ➢ A logical conclusion is given which is correctly reflected by the results of the investigation. ➢ Limitations and assumptions are insightful and logically justified. ➢ Suggestions to improve the investigation are realistic, well thought out, and logical.

Directed Investigation – Movie Critics

Overview

The purpose of this investigation is **to determine who the best judges of movies are**. You have **two choices** you can investigate (**select one**):

1. **Under 18s or Over 45s**
2. **Males or Females**

In order to begin your investigation, you will need to **carefully choose 3 movies** that you know well and **research** some **statistical data** that shows how different people rated them. You will then **analyse** the data (see below) and use your results to **discuss** any **conclusions** you make.

Gathering the Data

Once you have decided on the course of your investigation (above), you will need to **find statistical data on 3 movies**. Specifically, you will be searching for how different people rated the movie as a **score out of 10**. To do this, you will need to access the Internet Movie Database at **IMDb.com** and search for the movies you will be investigating. See the images below for how to access this.

1. Go to www.imdb.com and search for your movie title in the search bar.
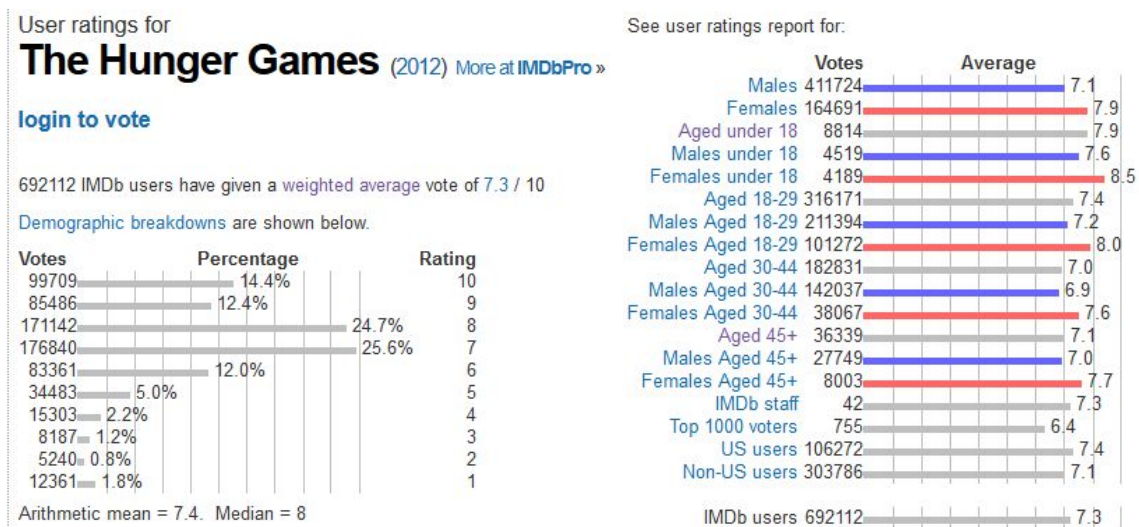
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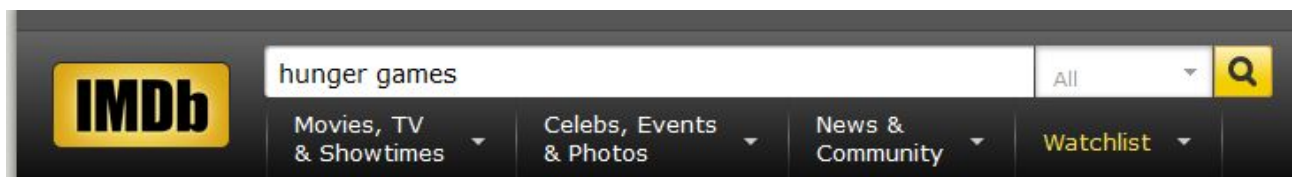
2. You will see a screen similar to the one below. Underneath the average rating for the movie, you will see a number that shows how many people have rated the movie. Click on this.

3. You will now see a page showing the breakdown of how different groups of people voted according to age, gender, etc. It shows the number of people that voted and what average ratings they gave for the movie.

4. Clicking on each of the demographics (categories) will give a further breakdown of the spread of votes.
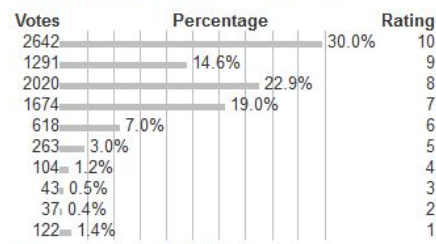
User ratings for
The Hunger Games (2012) More at **IMDbPro** »

(Aged under 18)

login to vote

8814 Aged under 18 have given a weighted average vote of 7.9 / 10

Demographic breakdowns are shown below.

Votes	Percentage		Rating
2642		30.0%	10
1291	14.6%		9
2020	22.9%		8
1674	19.0%		7
618	7.0%		6
263	3.0%		5
104	1.2%		4
43	0.5%		3
37	0.4%		2
122	1.4%		1

Arithmetic mean = 8.1. Median = 8

Analysis

You must now **use the data** available to you to **perform a statistical analysis** using what you have learned in this topic. **It is up to you which forms of analysis you choose to use**, but some things you may wish to consider/analyse are:

➢ **Mean, median and mode**

➢ **Histograms / Frequency tables / other graphs**

➢ **5 Figure Summary**

➢ **Box and Whisker Plots**

Make sure your working is clear and you **explain why you are doing each type of analysis**.

Discussion

Interpret your results by explaining the significance of your analysis.

➢ **Answer your initial aim by referring to your analysis section. (1/2 – 1 page)**
   o   What do your results mean?
   o   **Compare** your analysis for the 3 movies – can you make any conclusions or not?
➢ **Why** did you **select the 3 movies** you chose?
➢ What **assumptions** and **limitations** did you make during your investigation?

➢ What would you **change** about your investigation if you had more time available?