Modeling Inequality – A Case Study

Instruction Sheet

Duration:
15–20 minutes

Learning Goals:
Students will:

- understand how mathematical models can be used to make inequality visible;
- apply basic mathematical ideas such as percentages, shares, averages, and possibly the median to a human rights issue;
- recognize both the strengths and the limits of simplified models.

Materials:

- simplified distribution data
- worksheet with task instructions
- pencils, rulers, graph paper
- optional digital whiteboard or spreadsheet tool

Procedure

1. Introduction (about 3 minutes)
Connect the activity to the previous lesson with a question such as:

"We have seen that numbers can make human rights issues easier to understand. But how can we represent more complex inequalities in a way that helps us analyze them more clearly?"

Briefly explain that mathematical models are simplified representations of reality. They do not show everything, but they can help us identify patterns and think more carefully about fairness and inequality.

2. Group Work: Modeling Inequality (about 10–12 minutes)
Divide the class into small groups of 3–4 students. Give each group the same case study or a similar simplified distribution problem.

Task:
Use the data to create a visual model, for example:

- a bar chart,
- a distribution diagram,
- or a simple Lorenz-style curve, if students already know it.

Then answer the following:

- How much of the education budget goes to the poorest 70% of families?
- What does this distribution suggest about fairness in access to education?
- Which human rights concern can be connected to this pattern?
- What demand or change could be proposed from a human rights perspective?

The teacher supports students with the calculations if needed.

3. Presentation and Reflection (about 3–5 minutes)
Each group briefly presents its graph and main conclusions.

Possible reflection questions:

- What does the visual representation make especially clear?
- Which calculations were necessary to understand the problem?
- What are the limits of this simplified model?
- What important aspects of real life are missing?
- How could this kind of model help plan fairer education policies?

Name: _____ **Date:** _____

Worksheet: Modeling Inequality

1. Topic of the model:

2. What is being distributed in this case?

3. Write down the distribution data clearly.

4. Create a graph of the distribution. What type of graph did you choose?

☐ Bar chart
☐ Distribution diagram
☐ Lorenz-style curve
☐ Other: _____

5. Calculate the share received by the poorest 70% of families.

Show your work:

6. What does this result tell you about fairness in access to education?

7. Which human rights issue is connected to this model?

8. What is one possible human rights demand or policy response?

9. What does the model show well? What does the model leave out or simplify too much?

Case Study Card

Case Study Card: Education Spending in a City

SDG 4: Quality Education / SDG 10: Reduced Inequalities

In a city with **100 residents**, education spending is distributed as follows:

- the top **10% of families** receive **40%** of the education budget;
- the next **20%** receive **25%**;
- the middle **30%** receive **20%**;
- the bottom **40%** receive **15%**.

Optional extension:
Within the bottom 40%, only **30% of the funds** are spent on girls.

Questions to consider:

- How unequal is this distribution?
- How much do the poorest 70% receive altogether?
- What does this suggest about equal access to education?
- What additional inequality appears if gender is included?