Incentives to Affect Learning

Sorting and Changing Behavior

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Assumptions of the study

- **Teachers Matter!**
  - Teacher quality can explain more than a one-grade-level equivalent in test performance (Hanushek, 1992)
  - Impacts of teacher quality can persist for many years (Sanders and Rivers, 1996)
  - Tremendous variation in teacher effectiveness (Bembry et al., 1998; Hanushek, 1992; Sanders and Rivers, 1996)
  - Impact of teacher quality is far larger than any other quantifiable schooling input (Goldhaber, 2002)
- **Tremendous Investment in Teachers**
  - Largest single expenditure category is instructional salaries
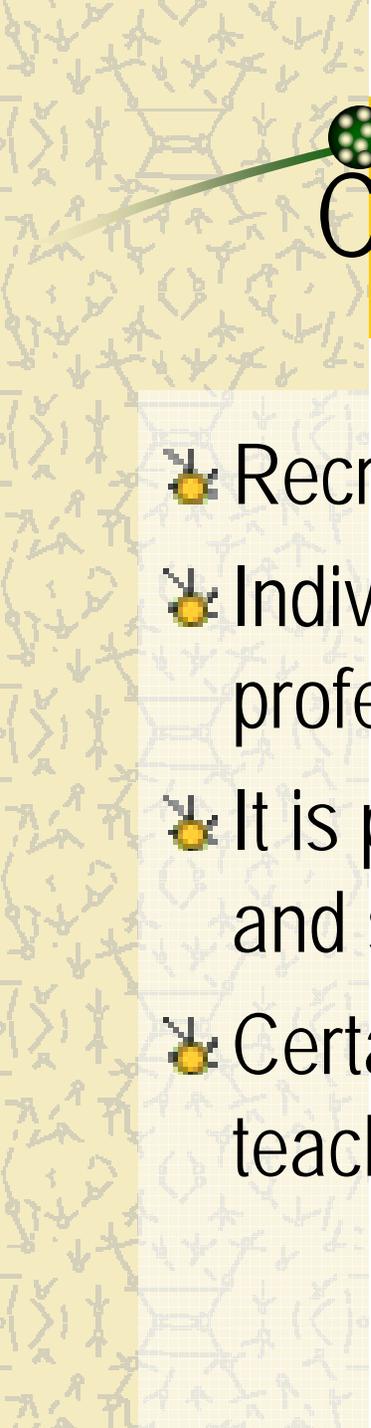
Challenge to the education system

- Recruitment of new teachers is proving difficult
- Individuals with Math and science choose other professions.
- It is proving hard to retain teachers with Math and science skills
- Certain schools have difficulty in attracting teachers

Why Teacher Incentives

- Align teacher behavior with goals of department
- Signals to teachers what the department and society values
- Bring agreement between preference of teachers and student

Forms of Incentives

- Input based incentive: payment based on skills and time worked
- Output based incentives:refers to some measured performance by students
- Non-pecuniary incentives:
  - Internal motivation
  - Prestige
  - Working conditions

Input Based Incentive

- Advantages
  - Removes risk from worker and prevents worker from focusing on easily measured outcome
  - Prevents teachers from teaching to the test
  - Appropriate if inputs are clear, problematic if they are not clear
  - What happens in the class room? Time is important but more important what is time used for

Incentive Conditions

- Assumes we can agree what is desirable in clear language
- Assumes there is accurate measure of what is valued
- Assume increasing learner performance is the goal
- Incentive compatibility

Incentives and Sorting

- Incentives change behavior of the individual to increase performance of learners.
- Sorting: certain individuals are inherently good at increasing marks. They have comparative advantage.
- Output based payment changes behavior, but improves the quality of the pool of teachers attracted to teaching.

Team Incentives

- Works only if there is joint production
- Works if team is small
  - Reward becomes insignificant if the team is larger =Y/N
  - Free rider problem

Problems of Current Incentive System

- Incentives do not reflect skills scarcity
- Incentives don't reflect difficulty of the teaching environment
- Incentives don't price lack of amenities

Impact of Undifferentiated Pay

- Those who cannot raise learning earn more in an undifferentiated pay schedule

- Those working in hard to teach schools loose the non-pecuniary part of their compensation.

Shortages

- Happens when price is not allowed to adjust freely to equate supply and demand
- Salary compression designed to meet equity needs does not necessarily solve shortages
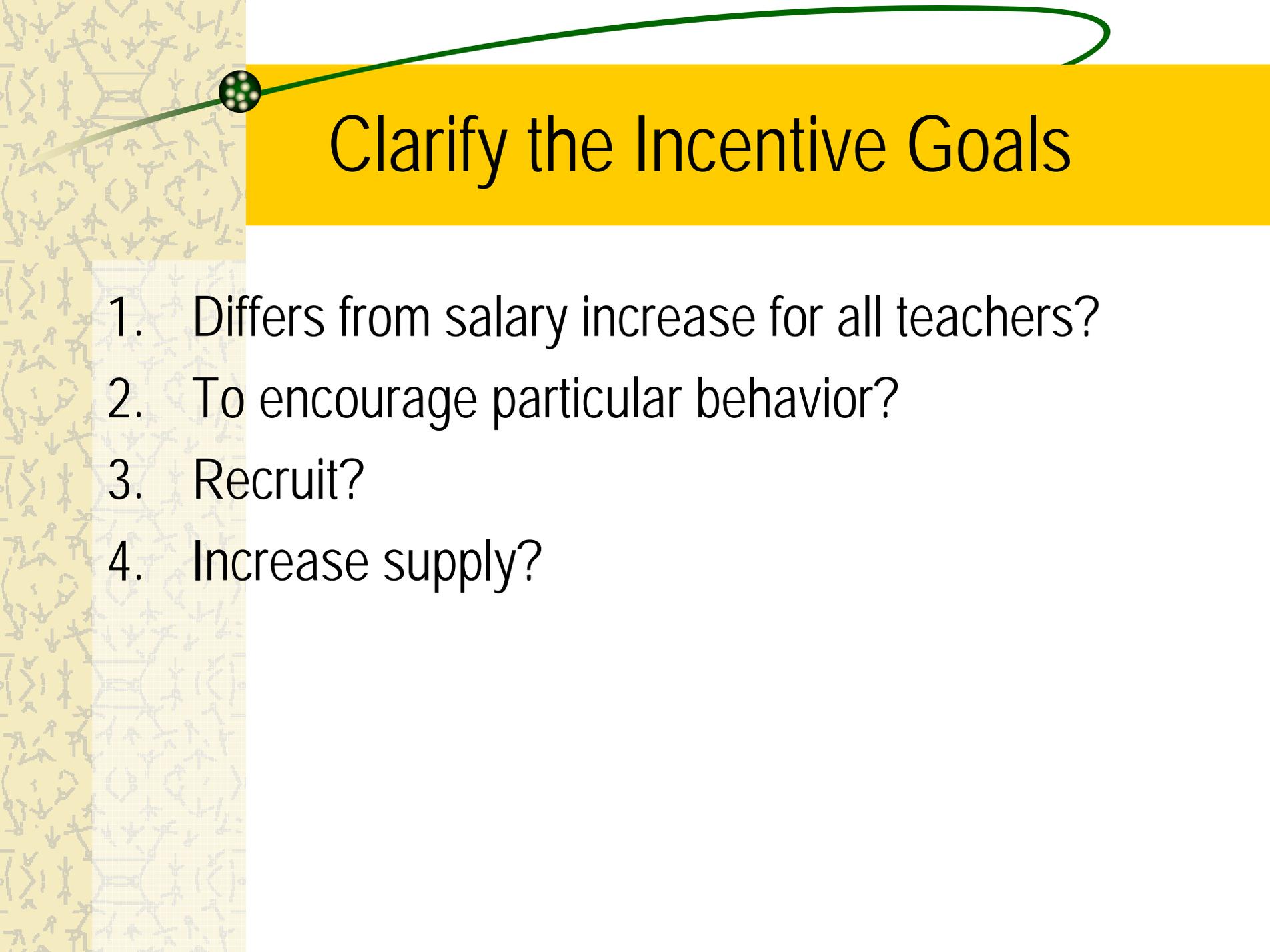
Clarify the Incentive Goals

1. Differs from salary increase for all teachers?
2. To encourage particular behavior?
3. Recruit?
4. Increase supply?

Examples of Incentives

	Variety	Aim
Bonus	1. Signing 2. Additional skills 3. Critical subjects 4. Hard to staff schools 5. Professional development	1. Recruitment 2. Development 3. Development 4. Recruitment/retention 5. Development

Examples of Incentives

	Variety	Aim
Housing incentives	1. Relocation allowance 2. Reduced rent 3. Reduced utility bill 4. Housing loans	1. Retention 2. Retention 3. Retention 4. Retention

Examples of Incentives

	Variety	Purpose
Financial	1.Tuition assistance 2. Loan forgiveness 3. Increased retirement benefits 4. Allowance	1. Recruitment 2. Recruitment/retention 3. Retention 4. Retention/scarcity
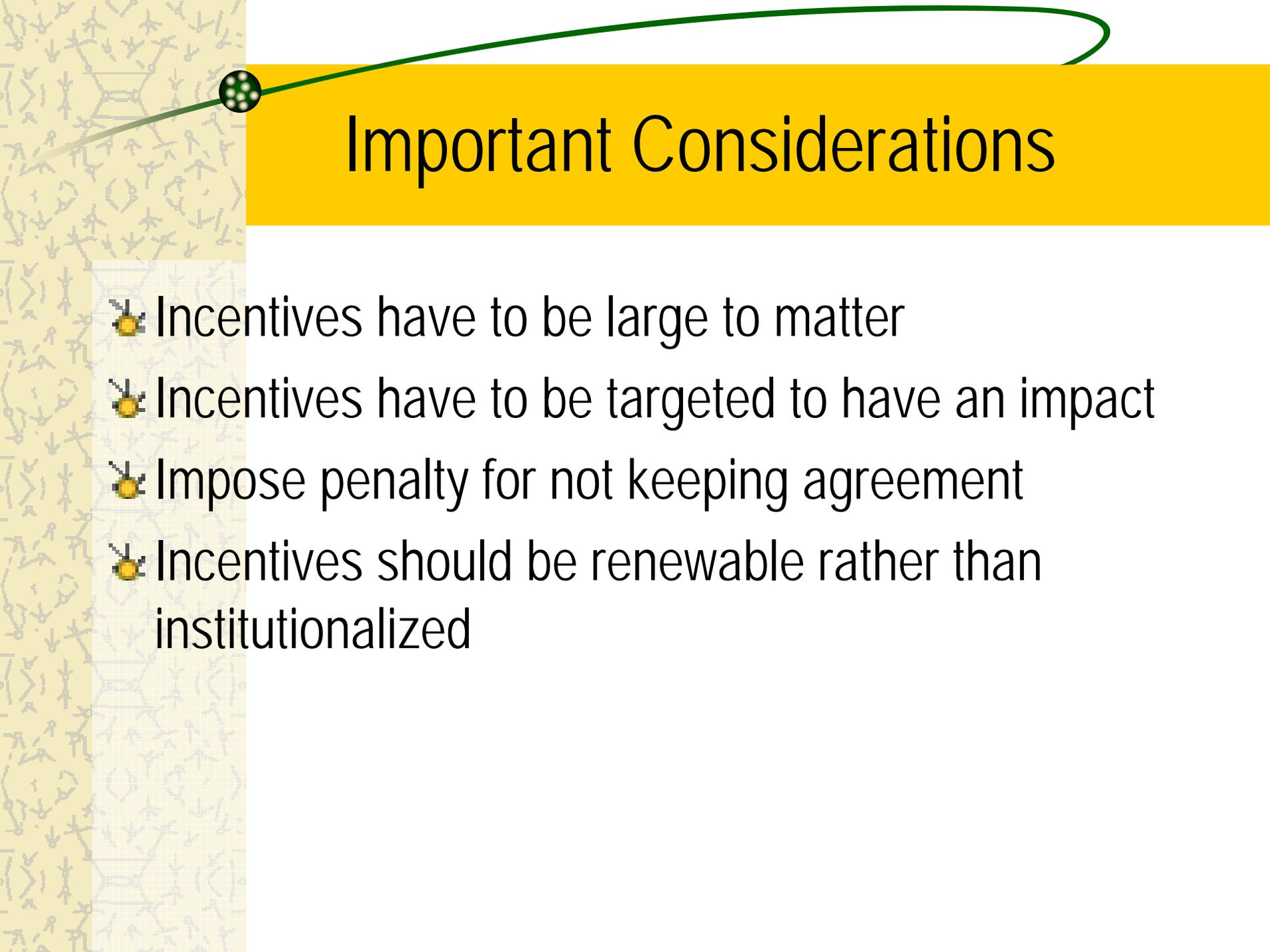
Important Considerations

- Incentives have to be large to matter
- Incentives have to be targeted to have an impact
- Impose penalty for not keeping agreement
- Incentives should be renewable rather than institutionalized
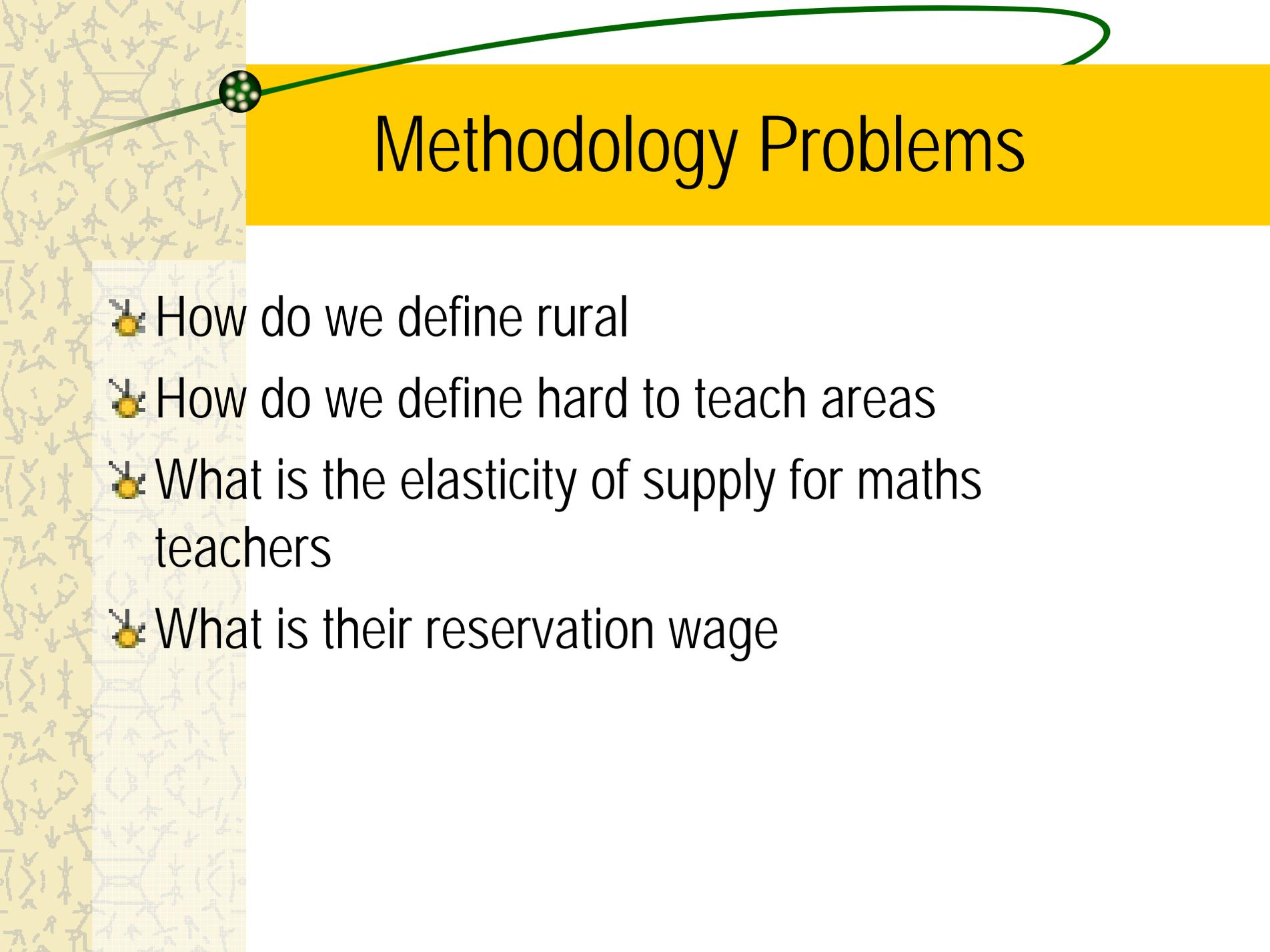
Methodology Problems

- How do we define rural
- How do we define hard to teach areas
- What is the elasticity of supply for maths teachers
- What is their reservation wage
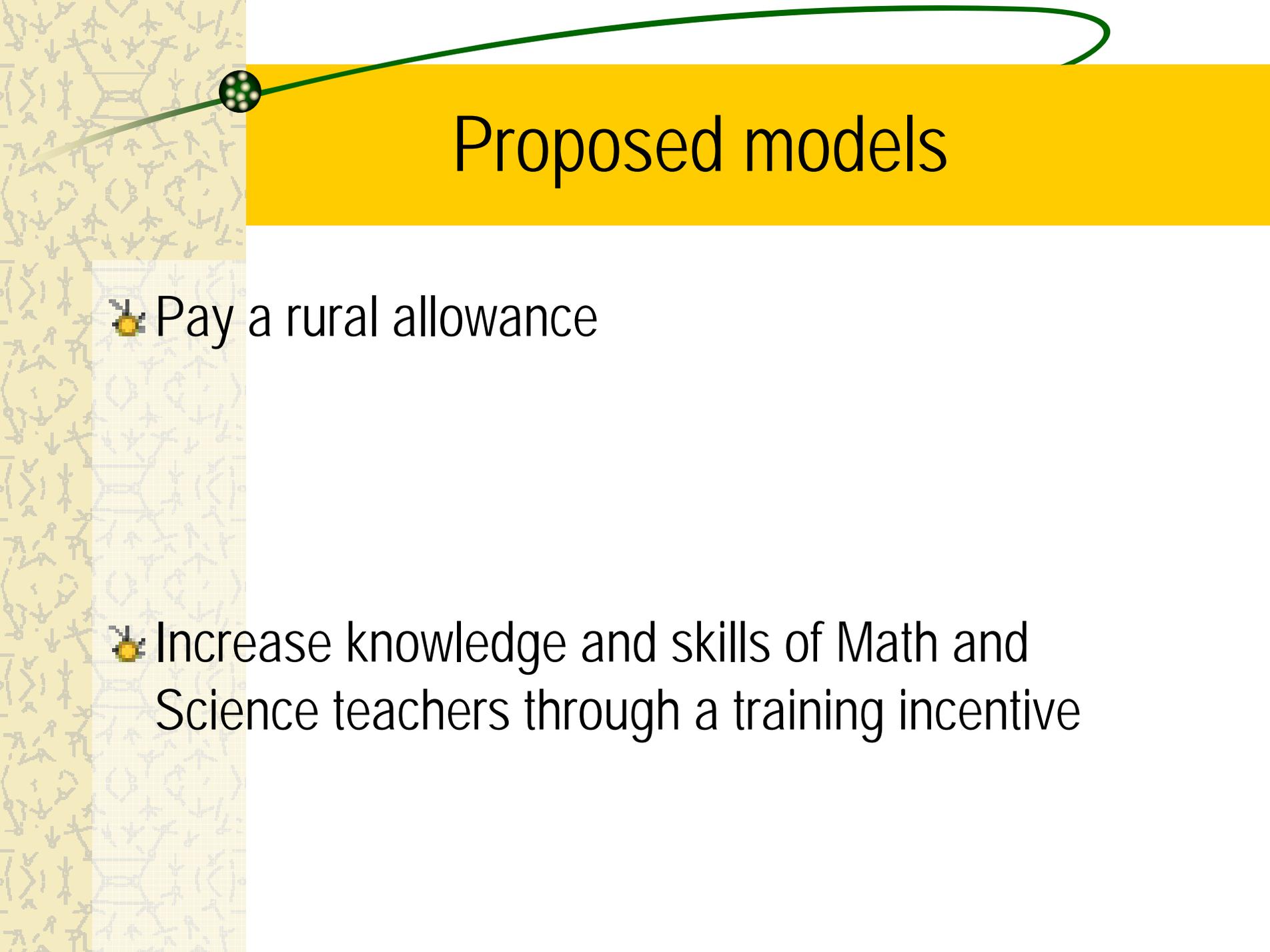
Proposed models

- Pay a rural allowance

- Increase knowledge and skills of Math and Science teachers through a training incentive

Least Problematic

- Focus on 1st and 2nd quintile schools
  - Already identified
  - Analysis is already done
- Remote schools using GIS
- Defining rural is a challange

How Should the Incentives Look Like

- Options.

    1. One lump sum shared among mathematics and science teachers__easy to manage.

    2. Assign a value for teachers with scarce skills and a rural allowance.

    3. Pay according to maths hours taught by teacher

- Separate recruitment, retention, distribution issues.
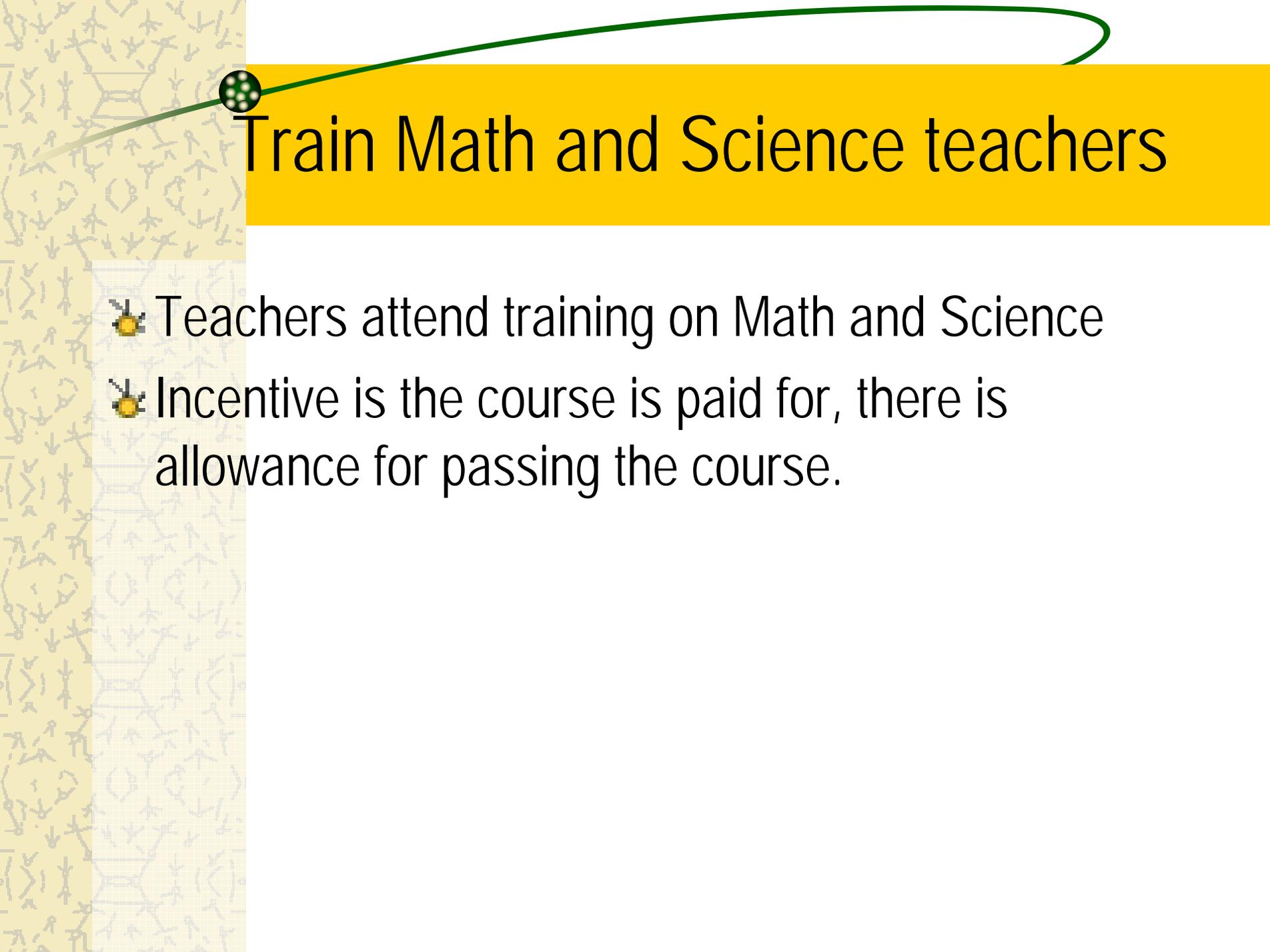
Train Math and Science teachers

- Teachers attend training on Math and Science
- Incentive is the course is paid for, there is allowance for passing the course.
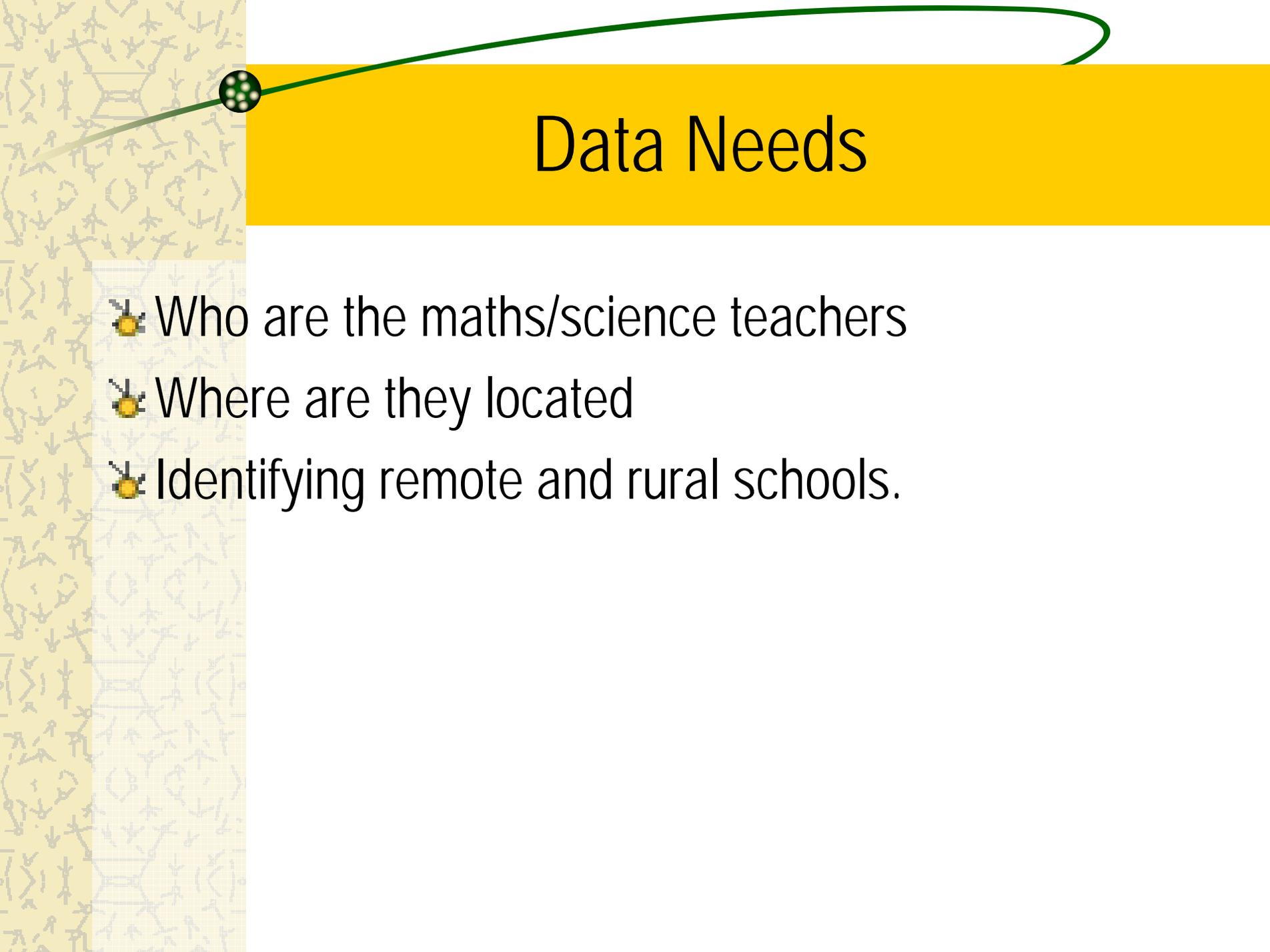
Data Needs

- Who are the maths/science teachers
- Where are they located
- Identifying remote and rural schools.