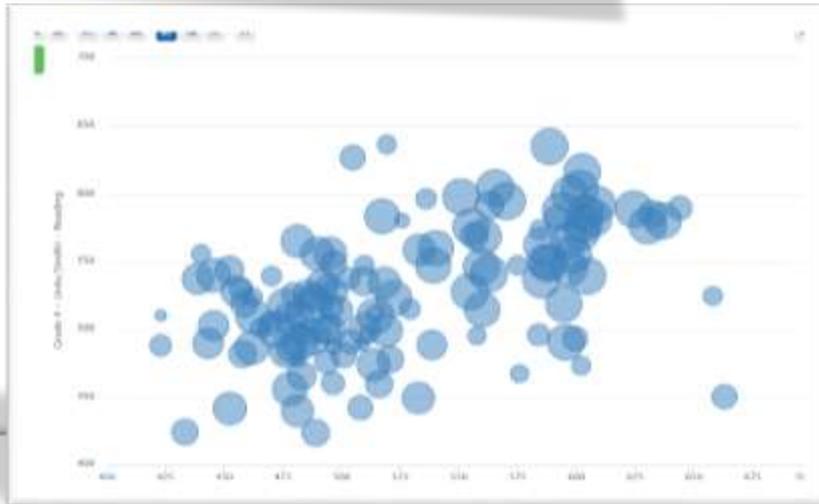
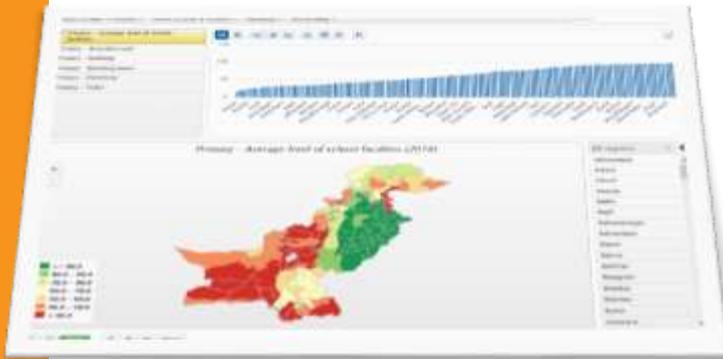


# 5<sup>th</sup> NATIONAL STAKEHOLDERS CONFERENCE

## Dissemination of National Achievement Test (NAT) Findings 2016-17

National Education  
Assessment System  
Ministry of Federal  
Education & Professional  
Training Islamabad  
(Pakistan)

January 24, 2018



# NAT 2016 – Today's presentation contents

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- NAT-2016 at a glance
- Grade 4 - Key highlights
- Grade 8 - Key highlights
- Physical facilities vs Student score
- Research questions
- HLM analysis findings at school & student level
- Way forward.

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- Short briefing on TIMSS study
- Short briefing on UNESCO 'Participation study'

## NAT 2016 at a glance – Grades & sample size

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- Assessment Grades: 4 and 8
- PPS sample : 30,000 students
- No. of schools planned: 1500 (20 students per school)
- Subjects assessed:
  - Grade 4: Mathematics, Urdu reading & Urdu Writing
  - Grade 8: Science, English Reading & English Writing
- Test language: Urdu, Sindhi and English
- Schools covered: Public, Private, NCHD, BECS & Community model schools

# NAT 2016 –Highlights - Assessment instruments

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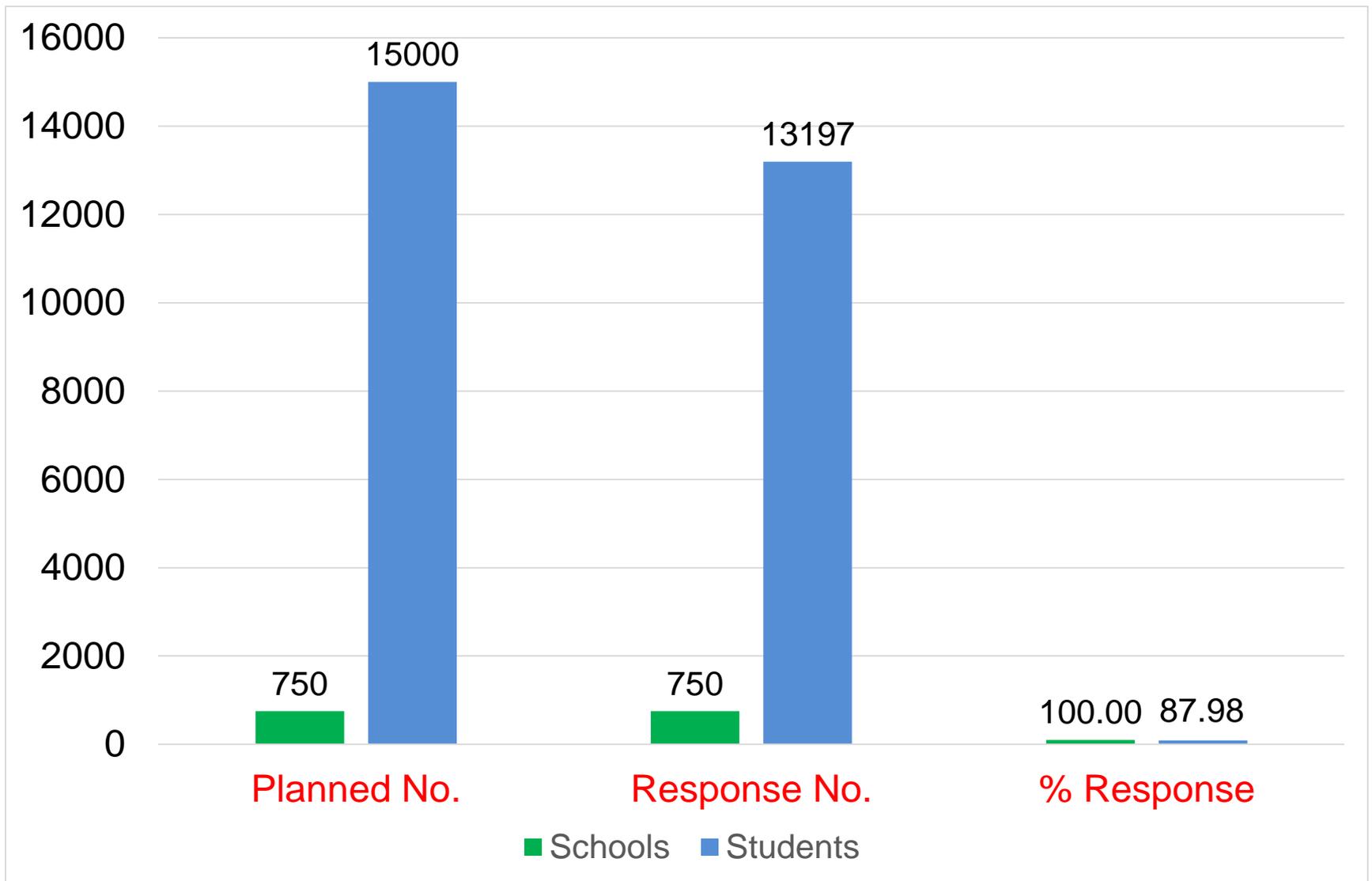
1. Standardised test (2 booklet 'A & B' in each subject)
2. Background questionnaires:
  - a) Students and their parents
  - b) Subject teachers (Mathematics, Science, Urdu/Sindhi, English)
  - c) Head teacher
3. Test administrator manual
4. Provision of stationary items for 30,000 sample students

# NAT 2016 – Highlights - Stationary items



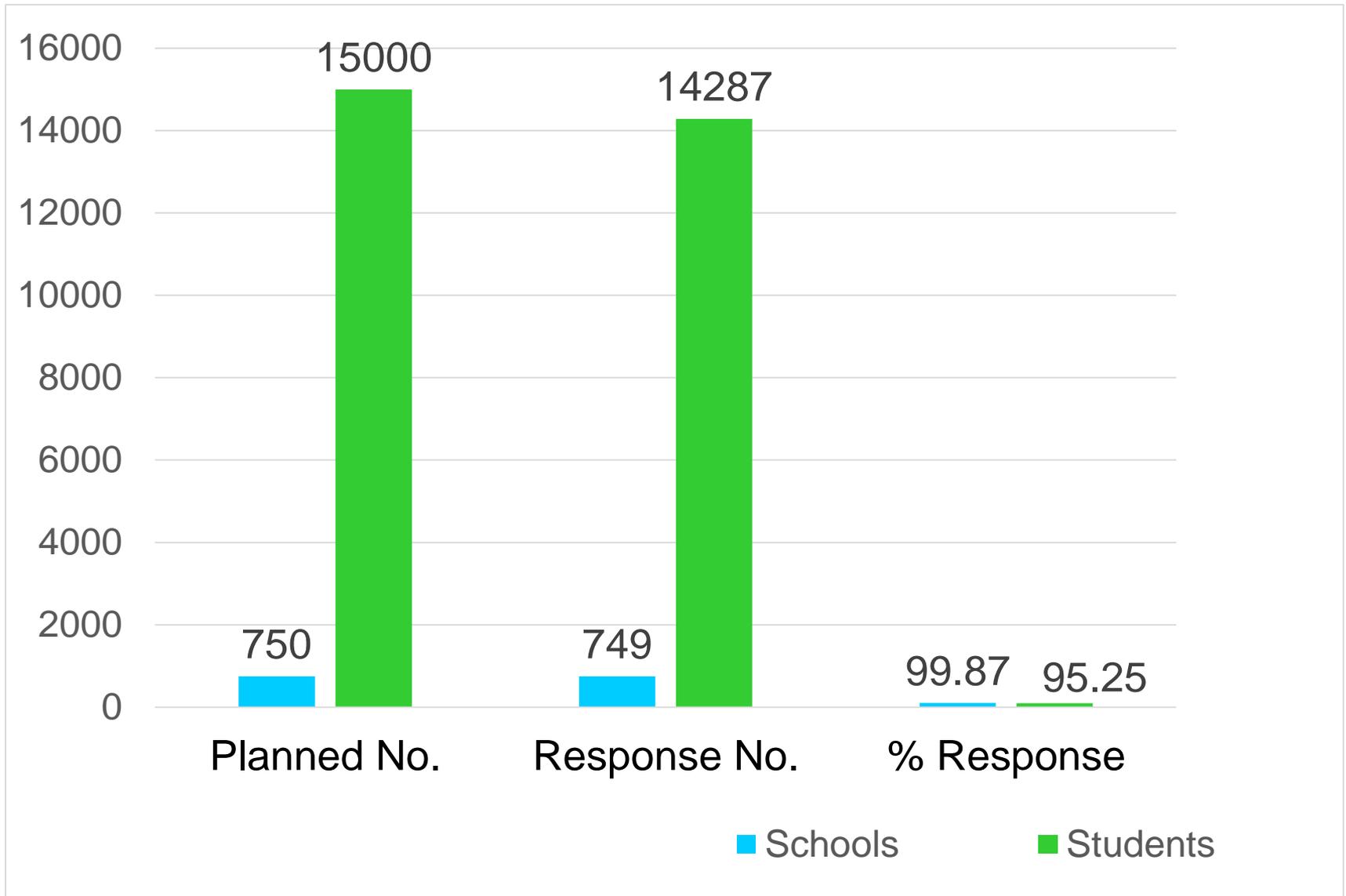
Stationary items with NEAS logo: Clip board, one pouch containing: ballpoint, pencil, eraser, sharpener, scale, protractor

# NAT 2016 at a glance – Grade 4 sample

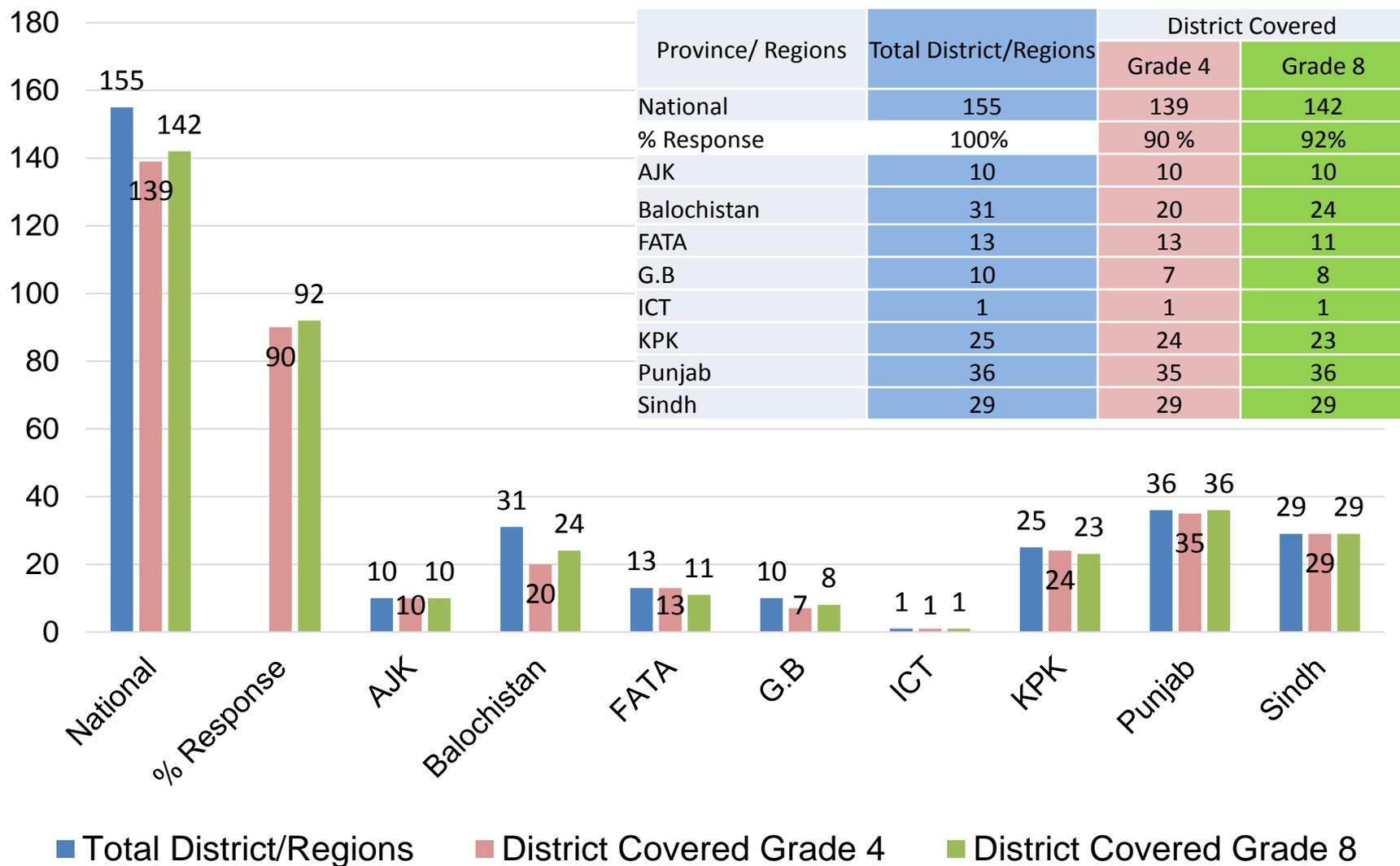


Source: NEMIS data base 2015

# NAT 2016 at a glance – Grade 8 sample



# NAT 2016 at a glance – District covered



Source: NEMIS data base 2015

## NAT 2016 at a glance – Characteristics

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- Assessed Grade 4 & 8 students before annual examination;
- Winter and summer zones students were assessed separately;
- New questions included in BGQs like nutrition, SES, health;
- Policy questions were framed according to international standard and shared with provinces/areas before NAT 2016;
- National Steering Committee constituted under Chairmanship of Federal Secretary, M/o FE&PT; and,
- Conducted without the financial and technical assistance of the international partners.

## NAT 2016 at a glance –Partner institutions

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- Punjab Examination Commission (PEC) Lahore Punjab;
- Balochistan Examination & Assessment Commission (BEAC), Quetta;
- Provincial Education Assessment Centre (PEACE) Jamshoro Sindh;
- Provincial Education Assessment Centre (PEACE) Abbottabad, Khyber Pakhtunkhwa;
- Kashmir Education Assessment Centre (KEACE), Muzaffarabad AJK;
- G.B Education Assessment Centre Gilgit; and,
- FATA Education Assessment Centre Peshawar.

## NAT 2016 at a glance – Services utilised

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- For Printing of assessment tools: Printing Corporation of Pakistan (PCP), Islamabad
- Sending & receiving assessment bags: Pakistan Post Office (PPO) Islamabad
- For data entry: National Institute of Psychology (NIP) Quaid -e- Azam University for 125,000 tools
- NEAS 5 Experts ➡ Trained 120 LMTS at national level  
➡ Trained 3300 Test Administrators (TAs) at provincial level  
➡ Assessed 27484 students + 27484 parents + 1499 Head Teaches + 6000 Teachers at school level ➡  
110 monitors deputed by M/o FEPT and provinces/regions

# NAT 2016 at a glance – Software used for analysis

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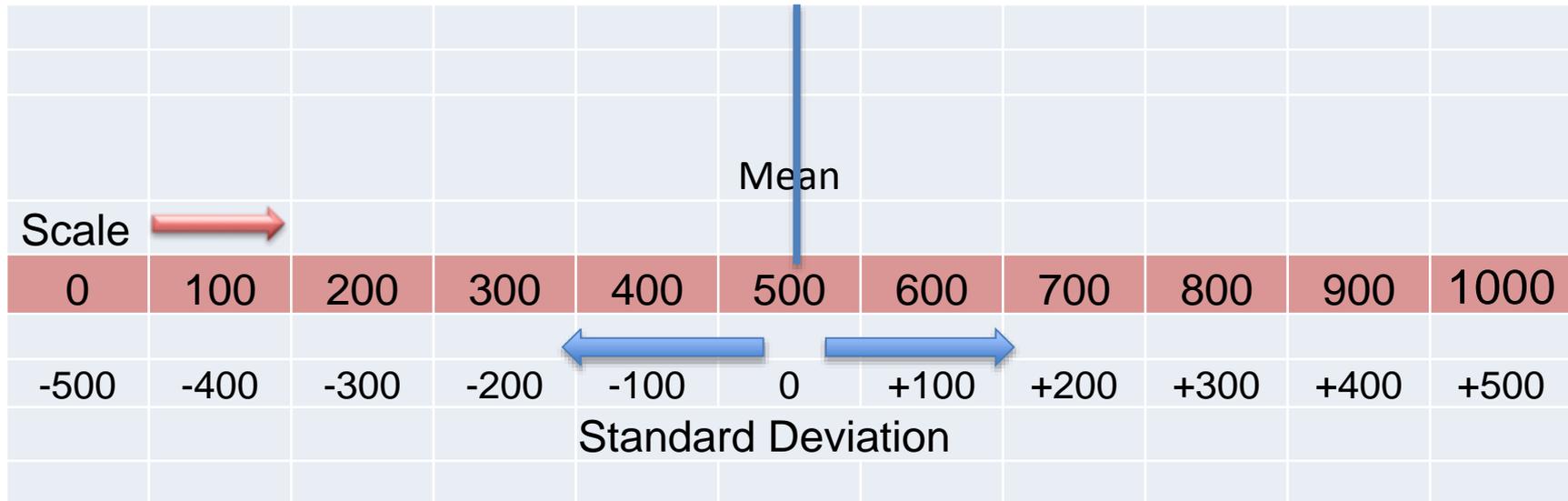
1. Microsoft Excel
2. SPSS Statistical Package for the Social Sciences
3. ConQuest (Generalised Item Response Modelling-IRT analysis)
4. HLM (Hierarchical linear modelling)
5. AM (AM is a statistical software package for analysing data from complex)
6. Iteman (provide detailed item and test analysis reports using classical test theory (CTT))
7. StatPlanet for visualization

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# Grade 4 - Key highlights

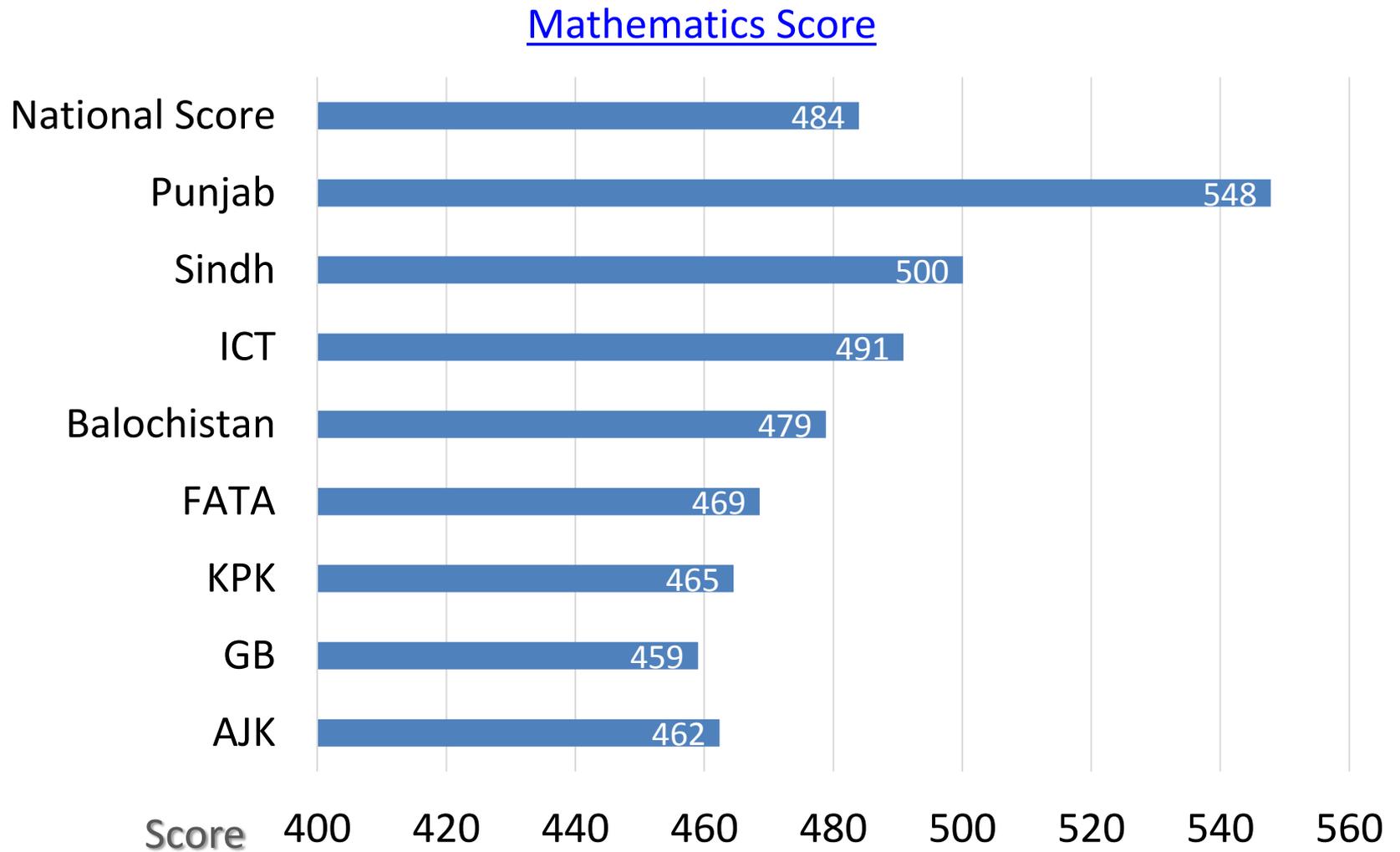
(i) Mathematics (ii) Urdu Reading (iii) Urdu Writing

# Understanding NEAS scale (mean 500)



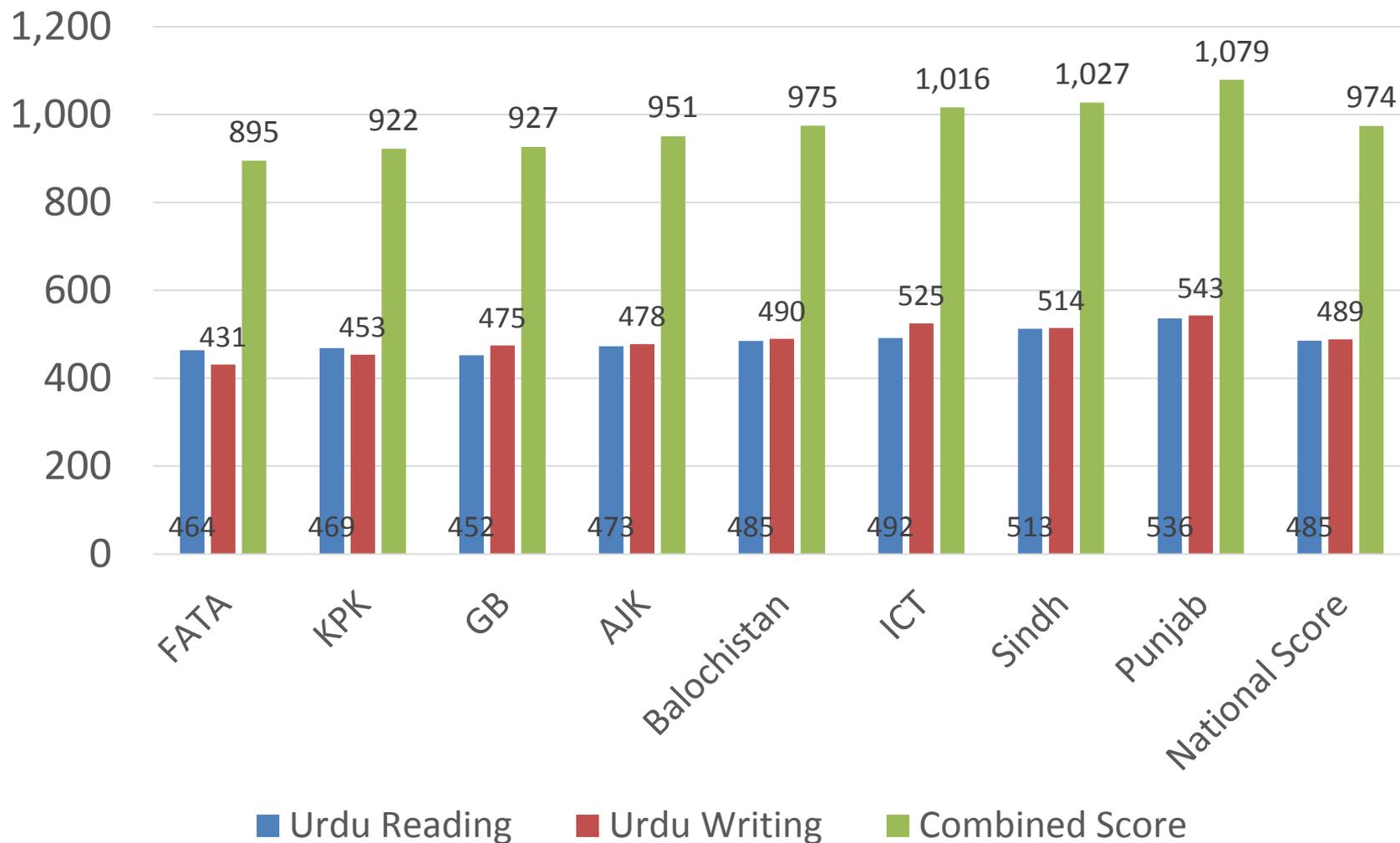
- The scale used in NEAS is the same as in TIMSS, PISA, SACMEQ, TOEFL, Vietnam, LOAS and many other develop & developing countries. The range of scaled scores is between **0-1000**.
- The achievement scales are constructed so that a student achieving 50% correct marks receives a **scaled score** of **500** and the **Standard Deviation** of the scale is set at **100**.

# Grade 4 – Maths score by nation & regions (mean = 500)

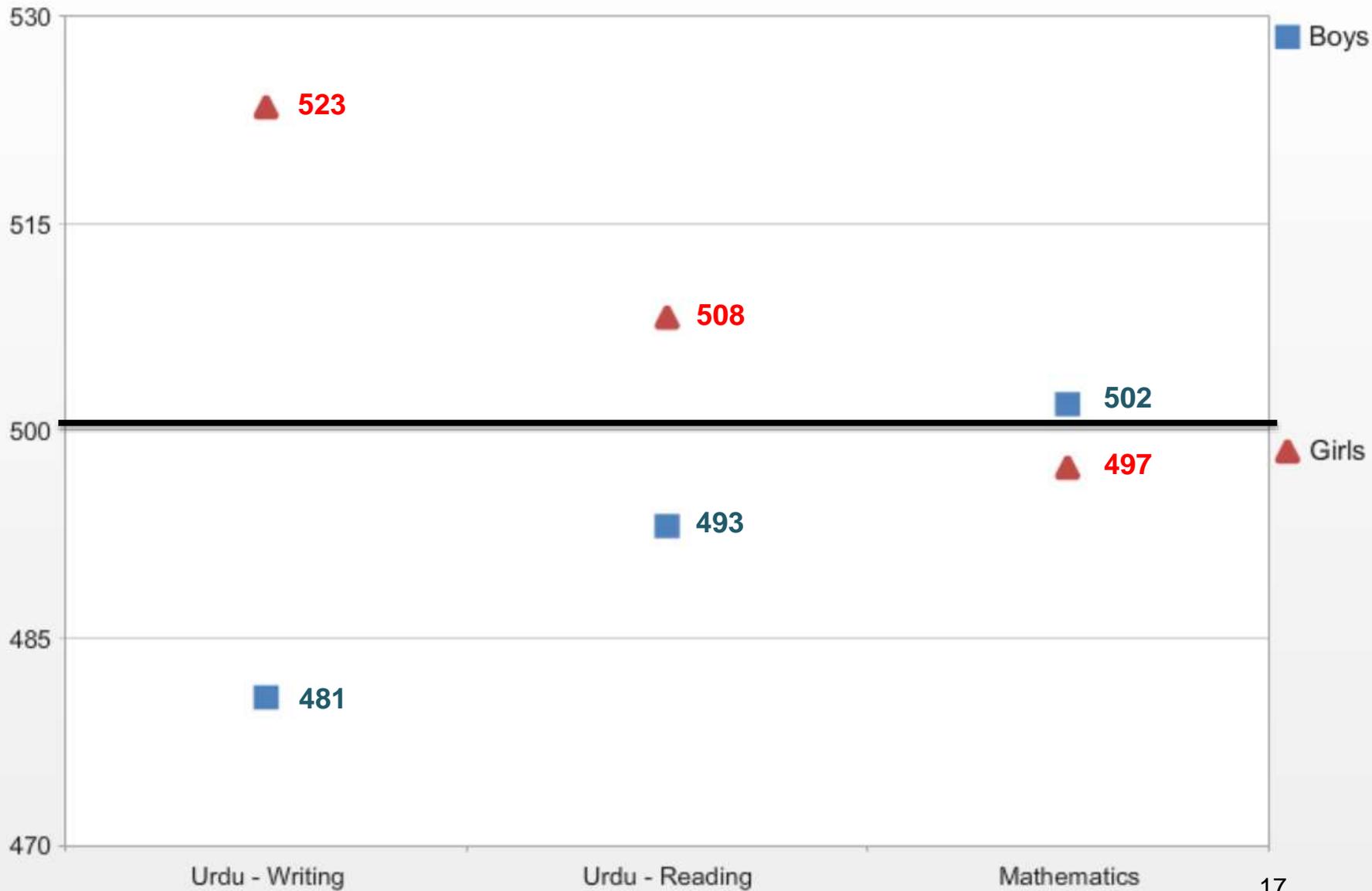


# Grade 4 – Urdu result by nation & regions (mean = 500 & combined mean = 1000)

## Urdu Reading, Writing & Combined Score



# Grade 4 – Subject results by gender (mean 500)



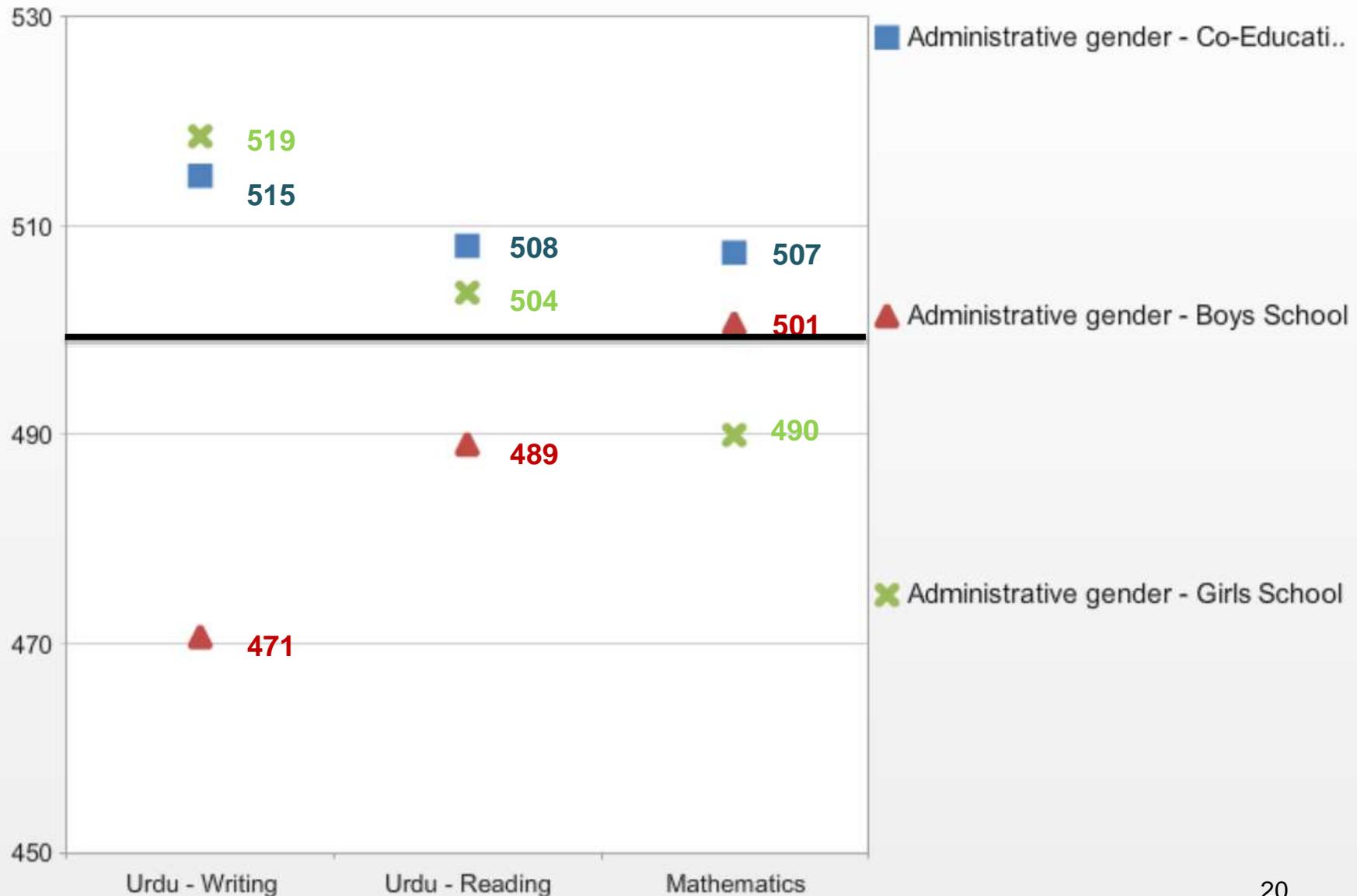
# Grade 4 – Subject results by location (mean 500)



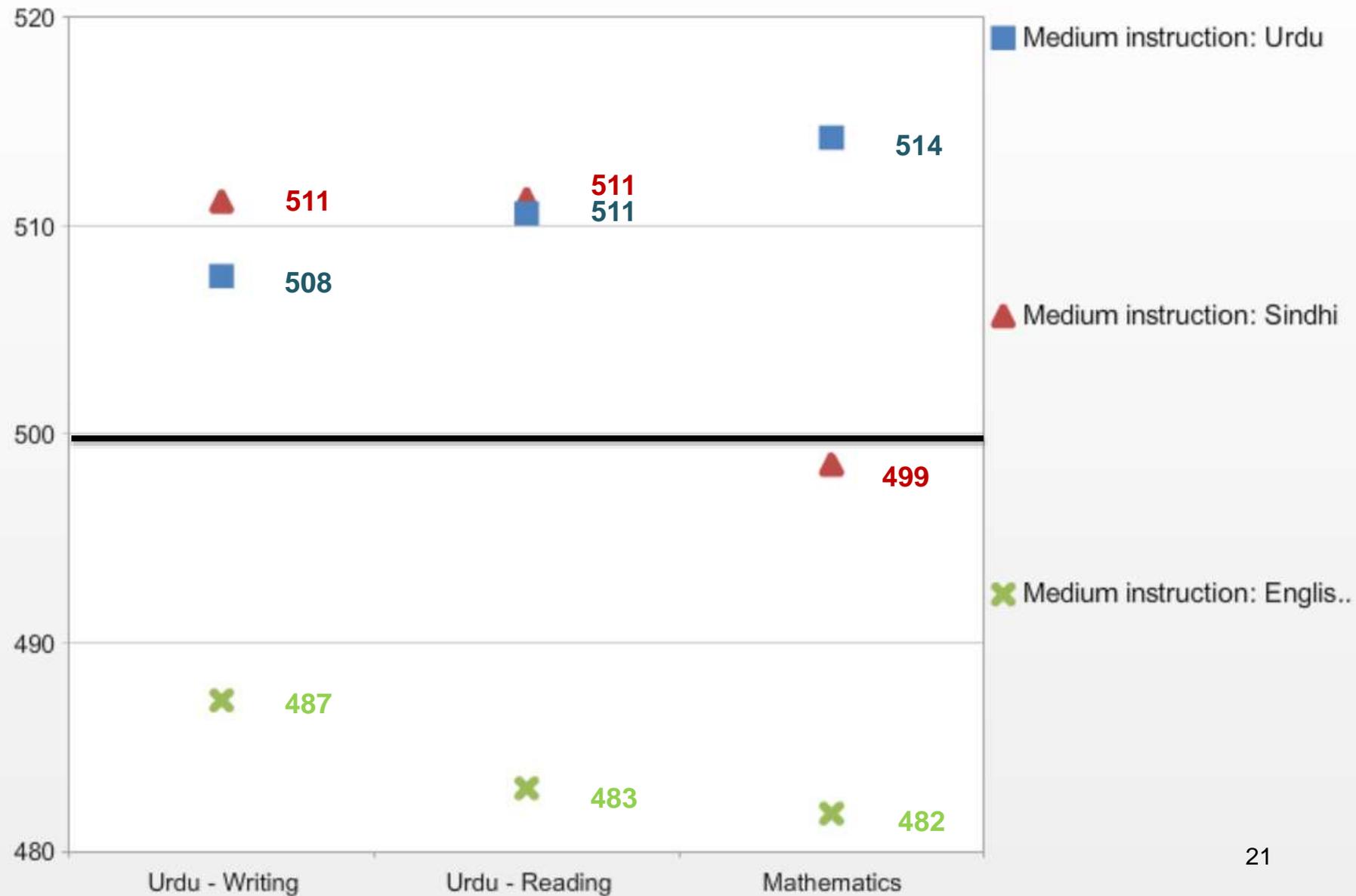
# Grade 4 – Subject results by school zone (mean 500)



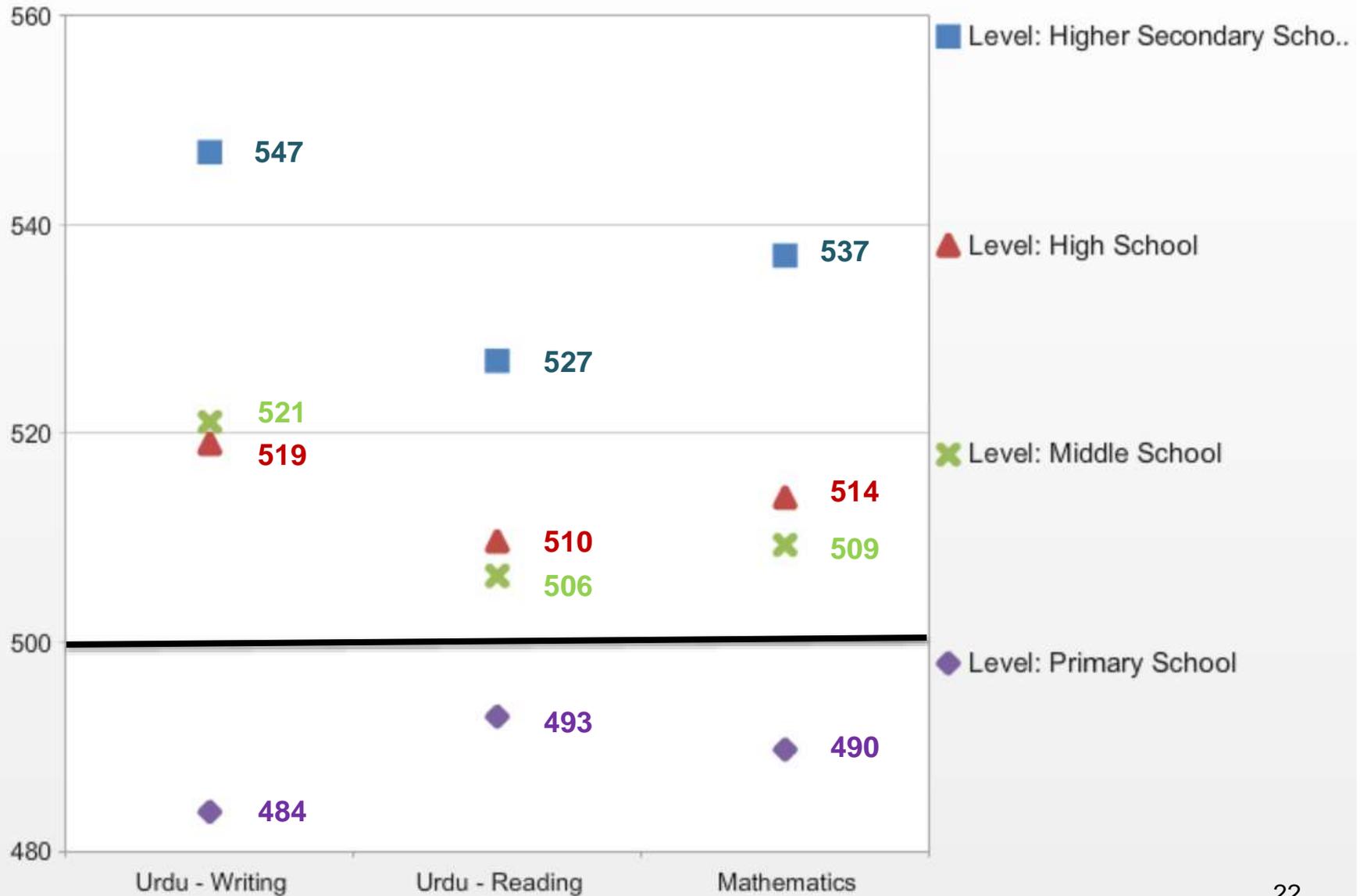
## Grade 4 – Subject results by administrative gender (mean 500)



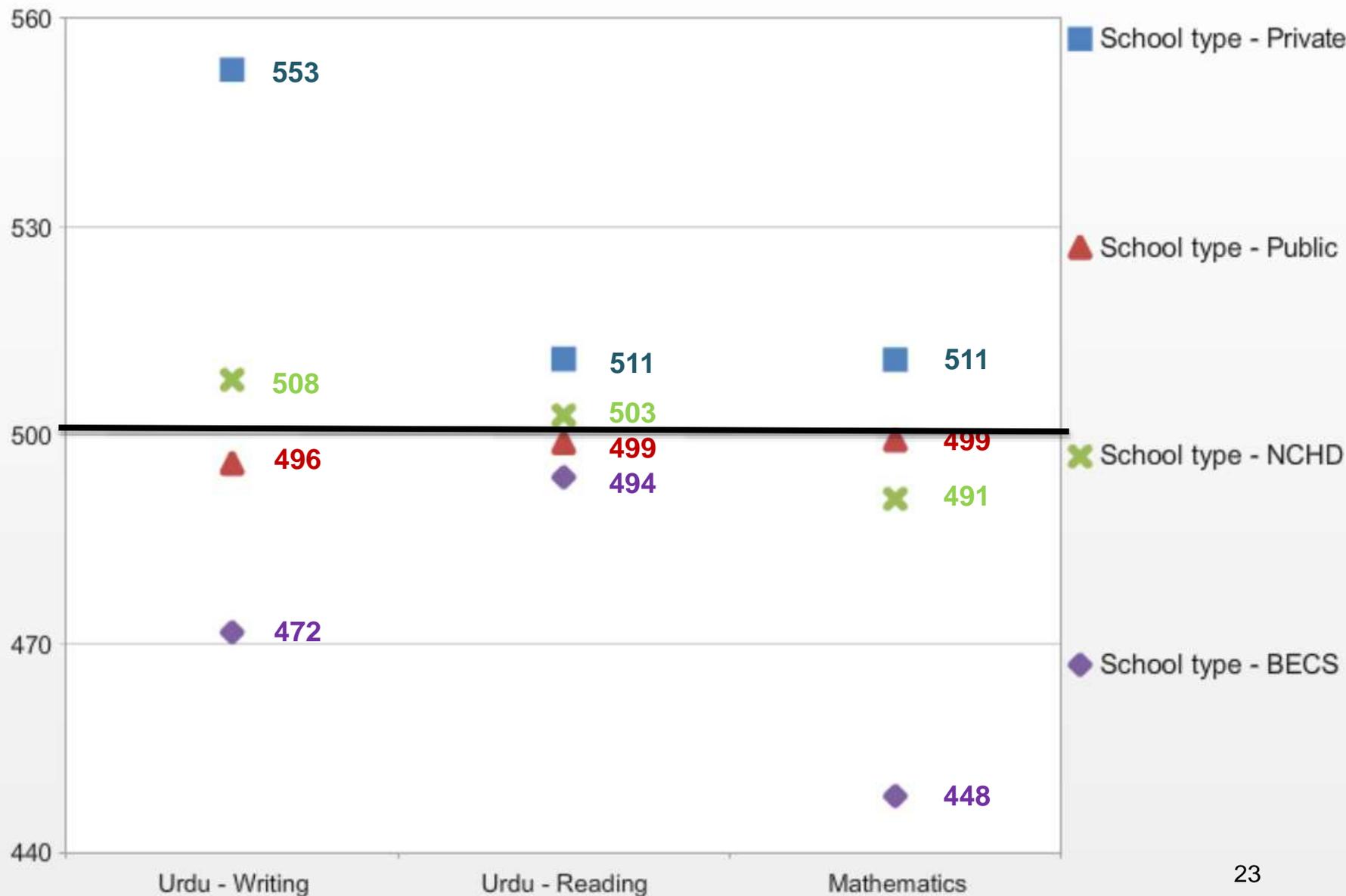
# Grade 4 – Subject results by medium of instruction (mean 500)



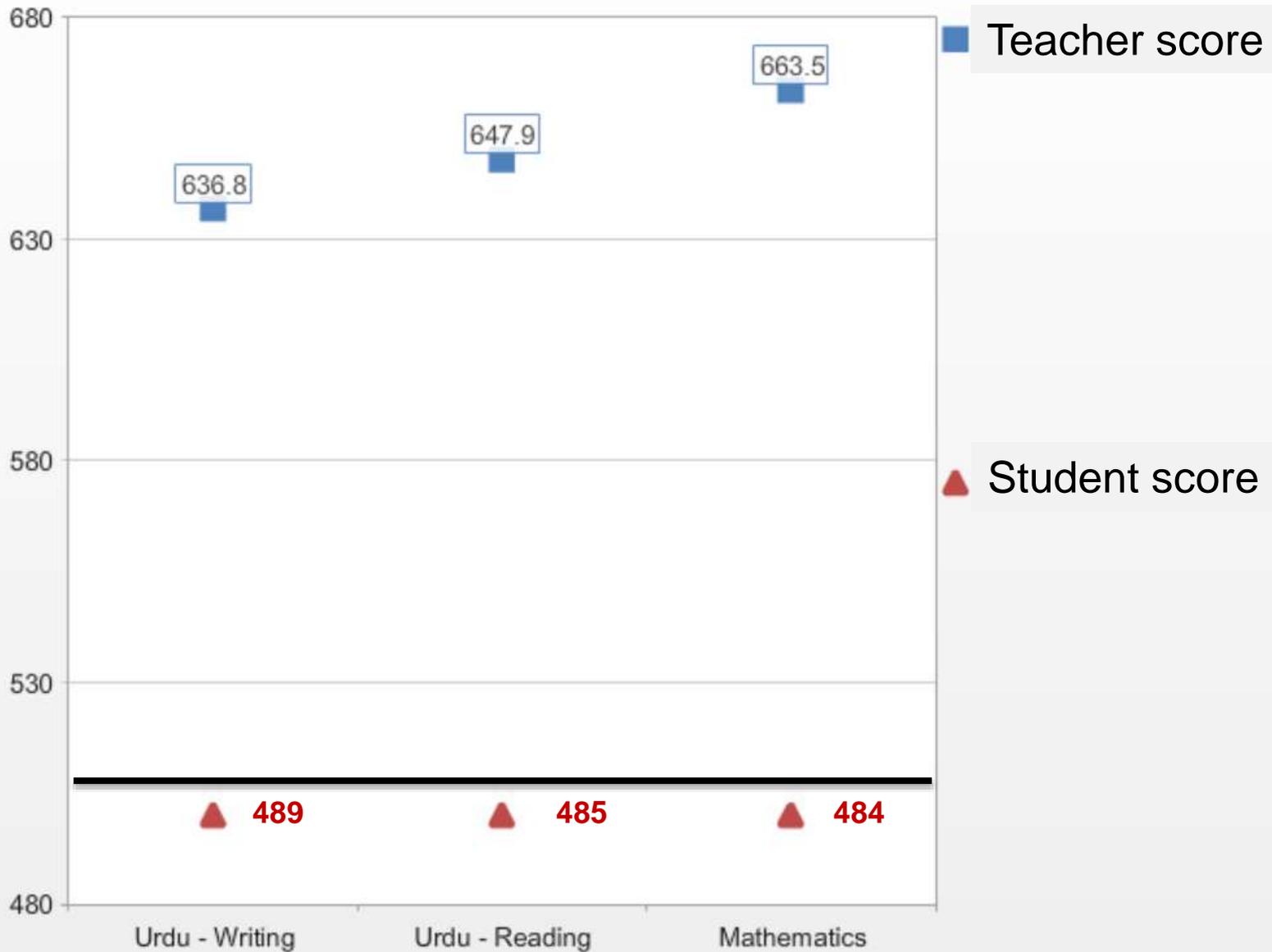
# Grade 4 – Subject results by school level (mean 500)



# Grade 4 – Subject results by school type (mean 500)



# Grade 4 – Subject results teachers & students (mean 500)

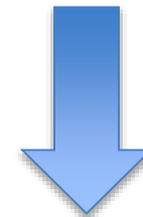


# son Map: Grade 4 Math

Item which were **above**  
average difficulty

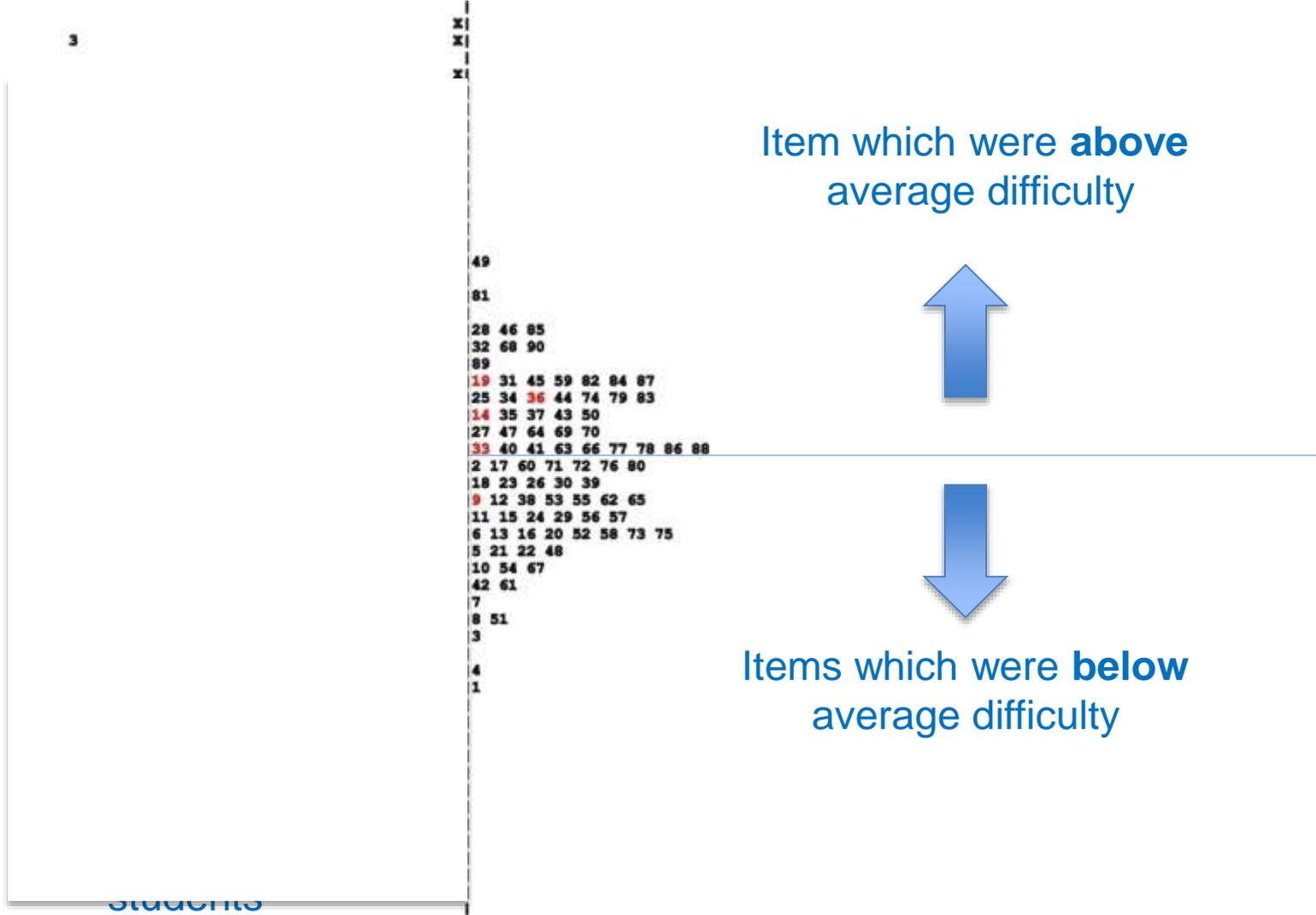


49  
81  
28 46 85  
32 68 90  
89  
19 31 45 59 82 84 87  
25 34 36 44 74 79 83  
14 35 37 43 50  
27 47 64 69 70  
33 40 41 63 66 77 78 86 88  
2 17 60 71 72 76 80  
18 23 26 30 39  
9 12 38 53 55 62 65  
11 15 24 29 56 57  
6 13 16 20 52 58 73 75  
5 21 22 48  
10 54 67  
42 61  
7  
8 51  
3  
4  
1

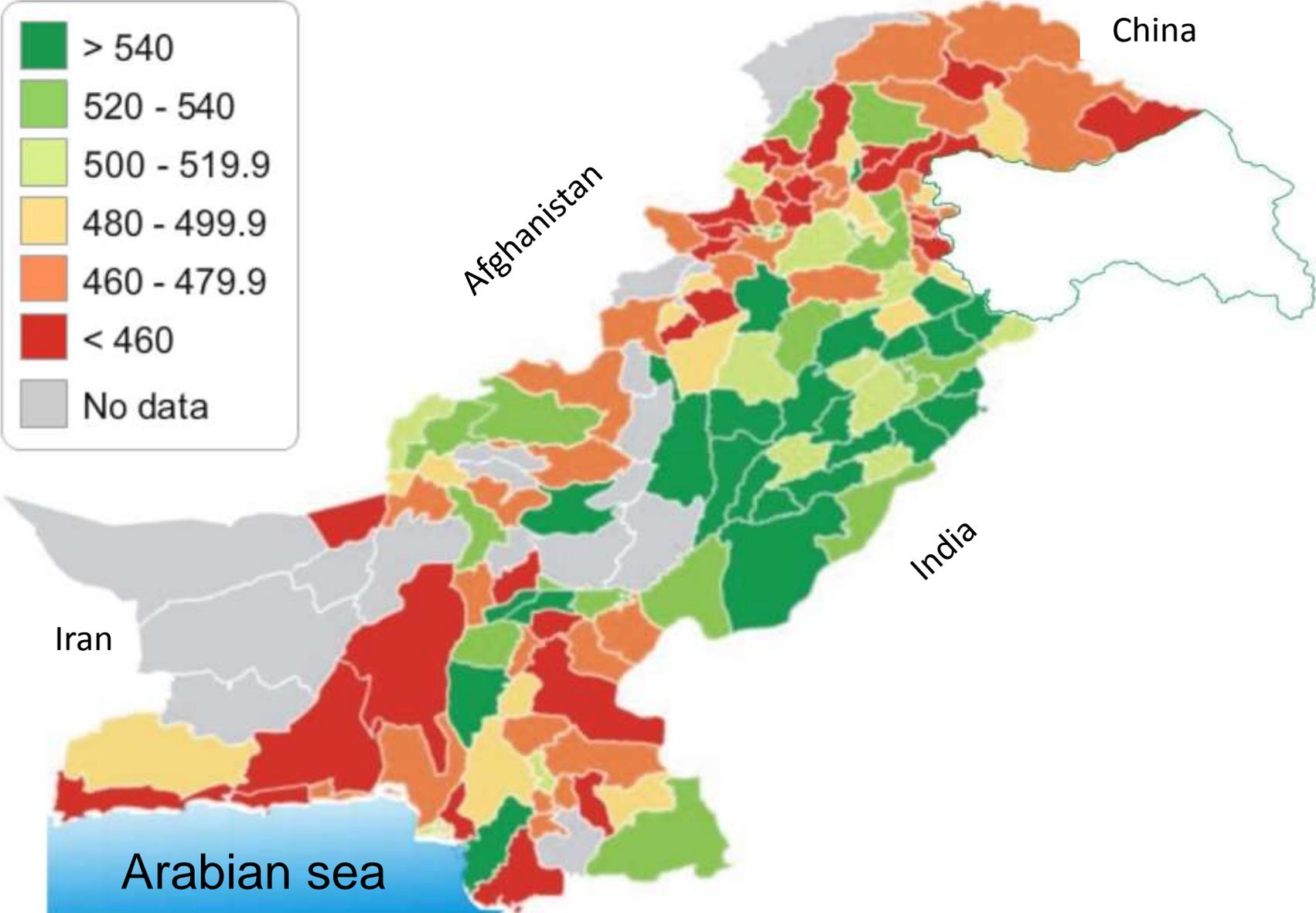


Items which were **below**  
average difficulty

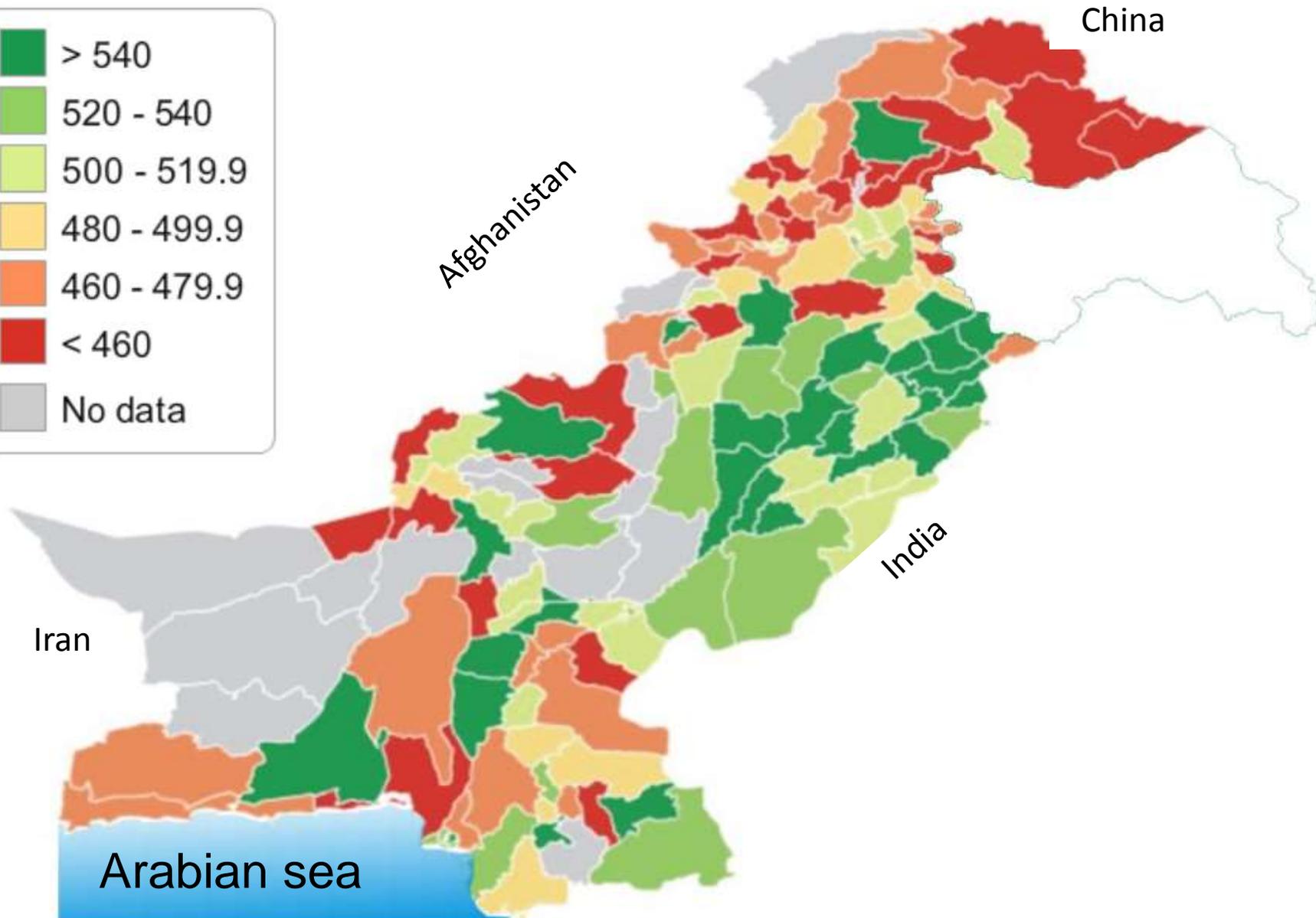
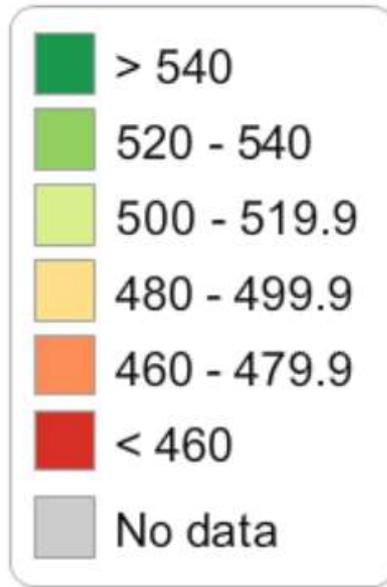
# Item-Person Map: Grade 4 Math



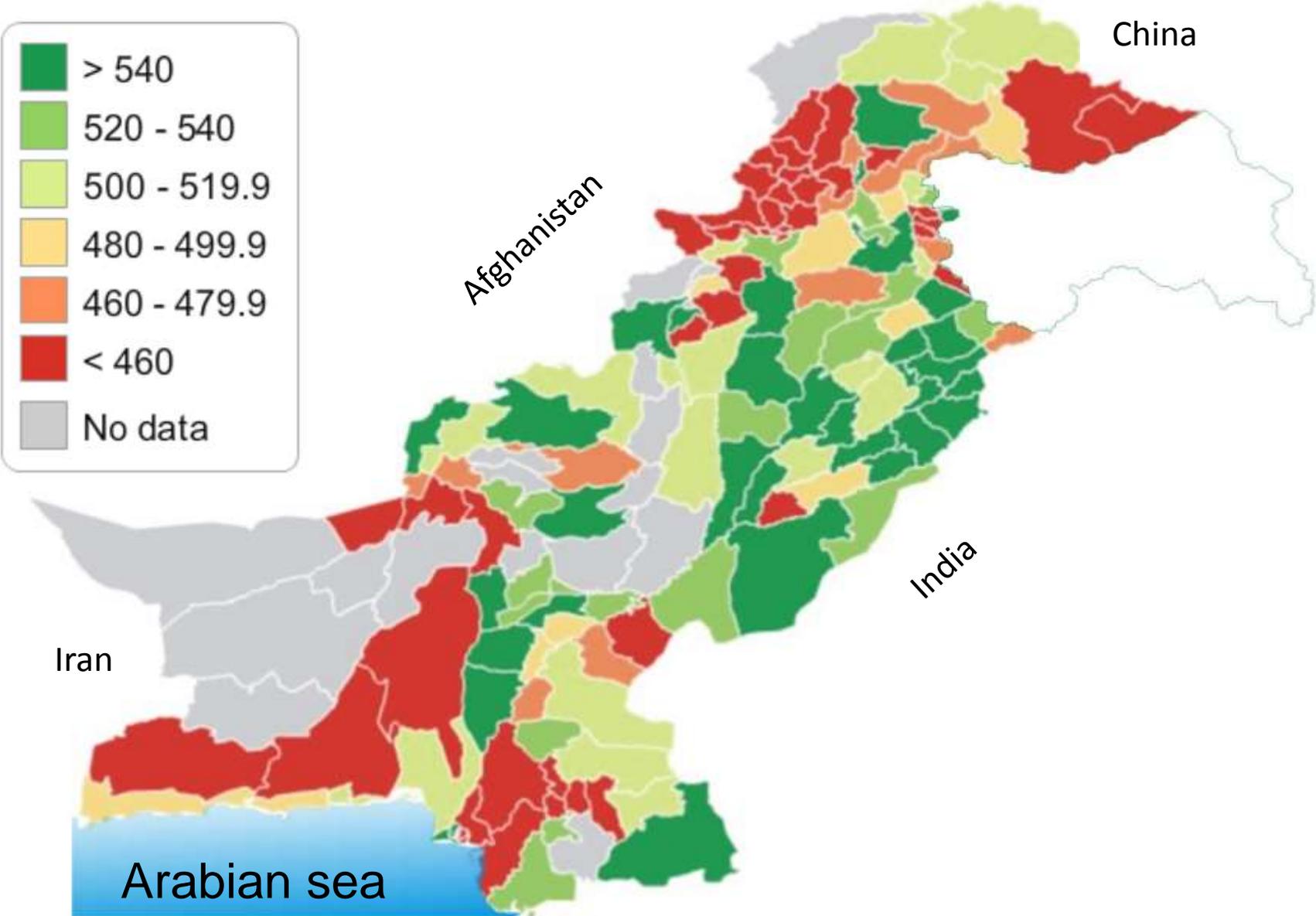
# Grade 4 – Mathematics (mean = 500)



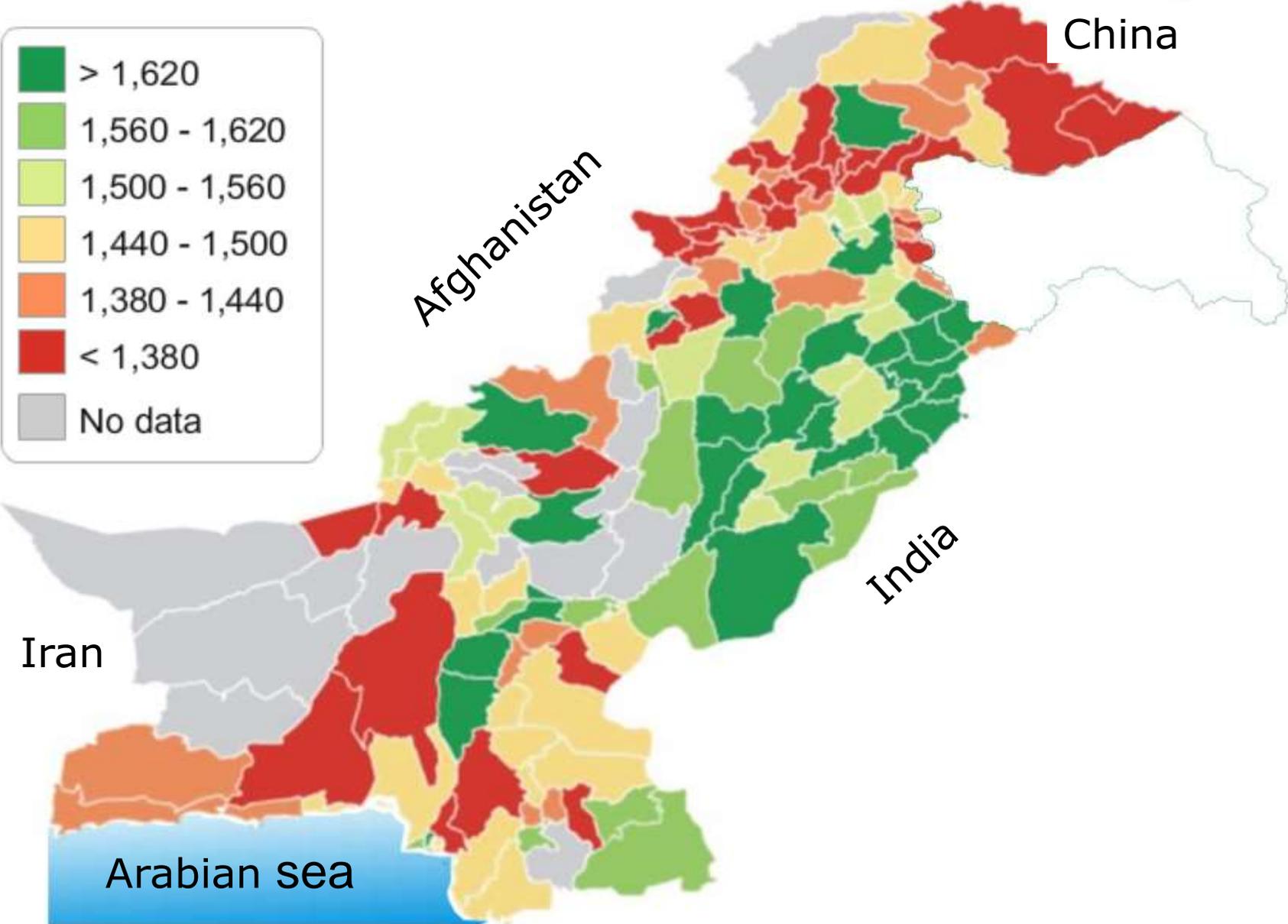
# Grade 4 - Urdu/Sindhi – Reading (mean = 500)



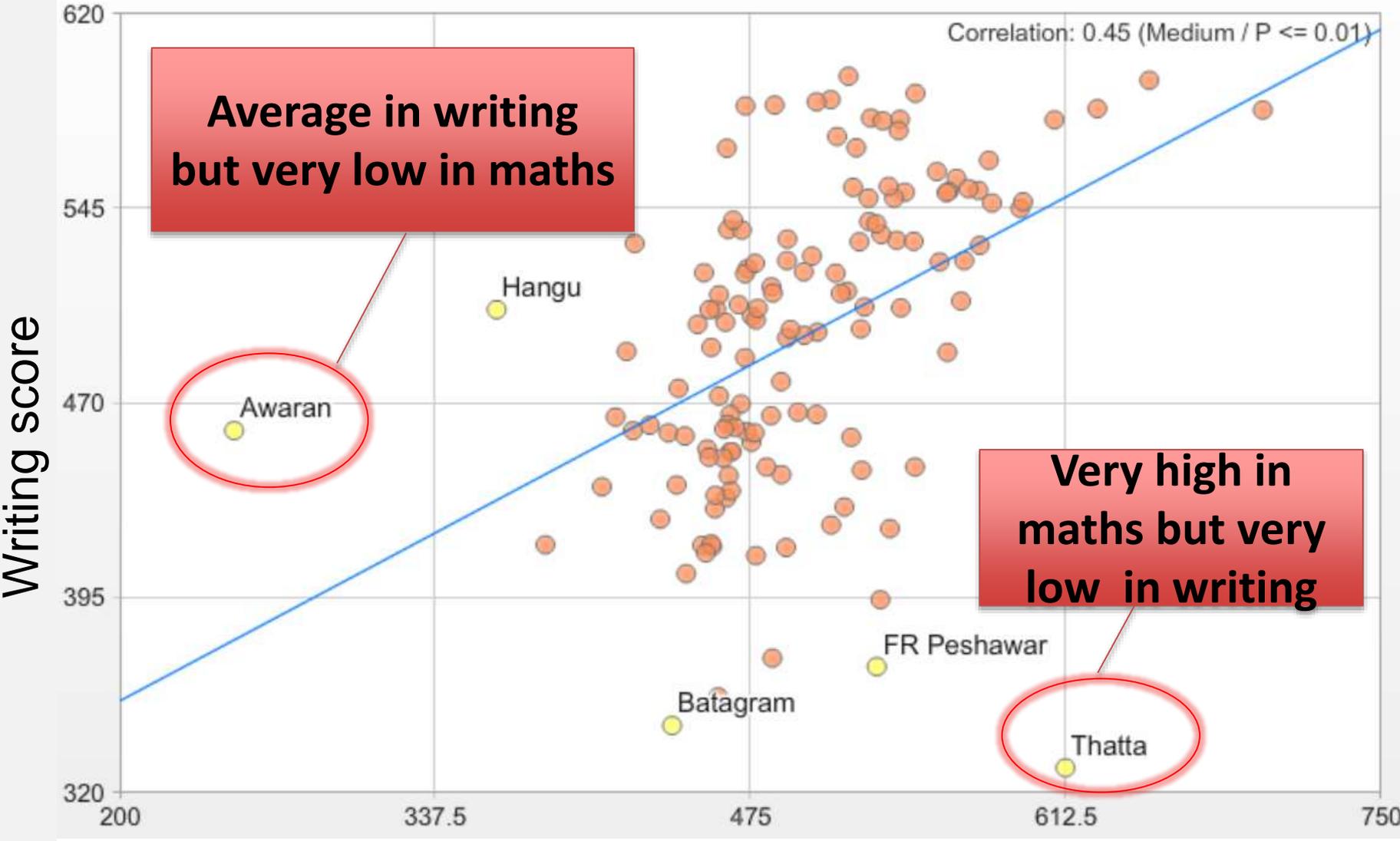
# Grade 4 - Urdu/Sindhi – Writing (mean = 500)



# Grade 4 – Combined Score (mean = 1500)



# Grade 4 – Maths vs Writing Score (mean 500)



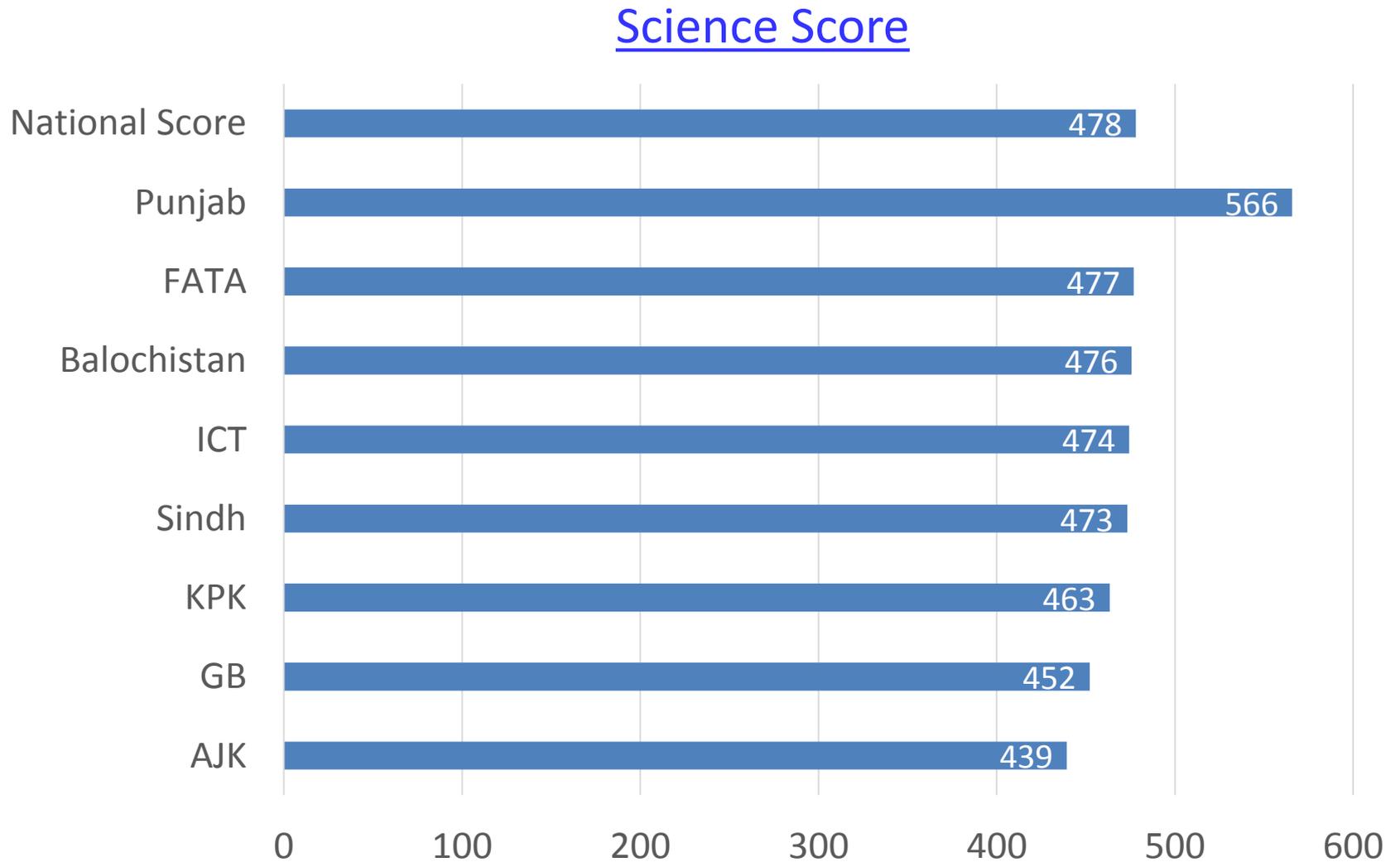
Mathematics score

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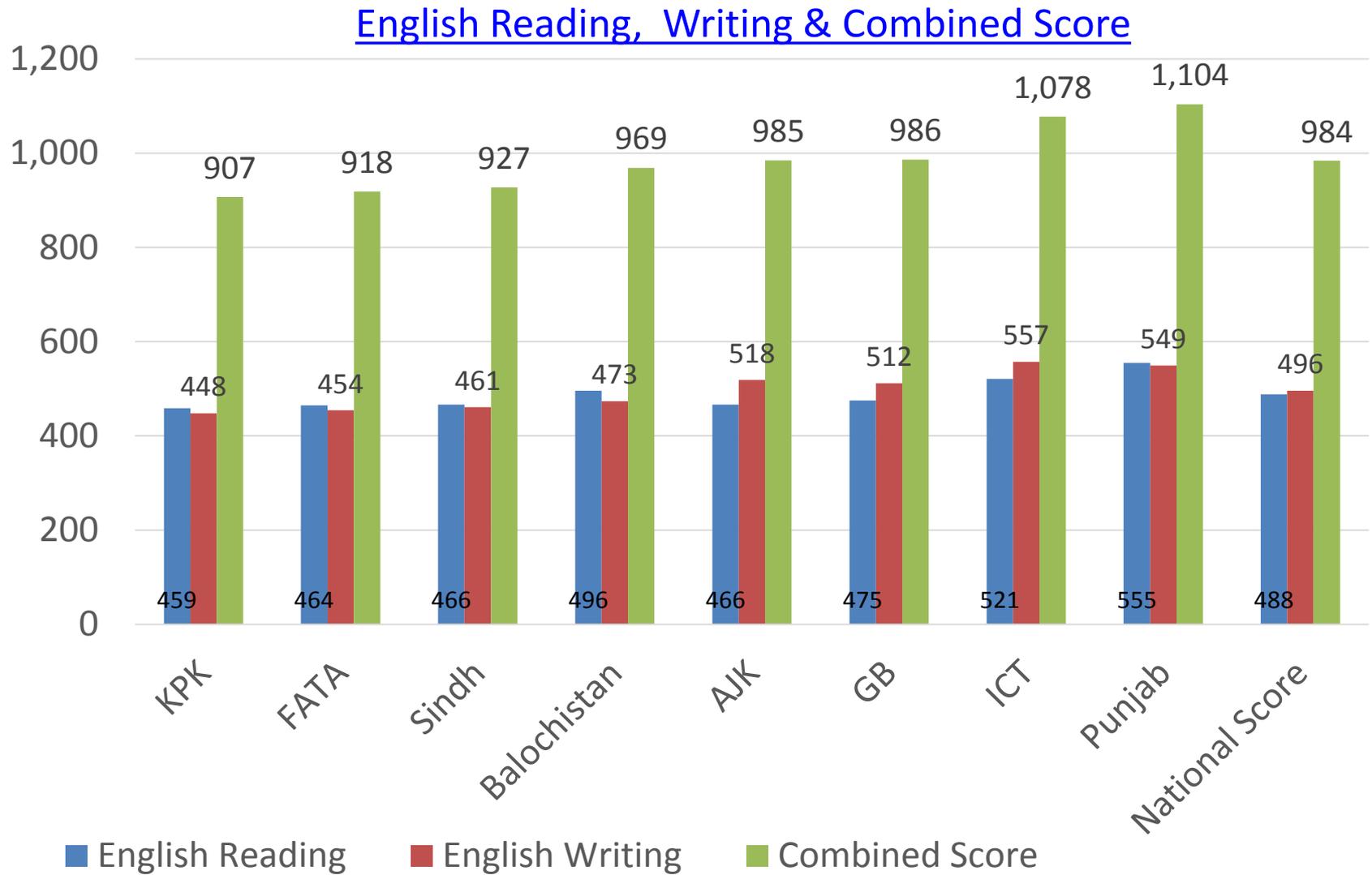
# Grade 8 – Key highlights

(i) Science (ii) English Reading (iii) English Writing

# Grade 8 – Science result by national & region (Mean=500)



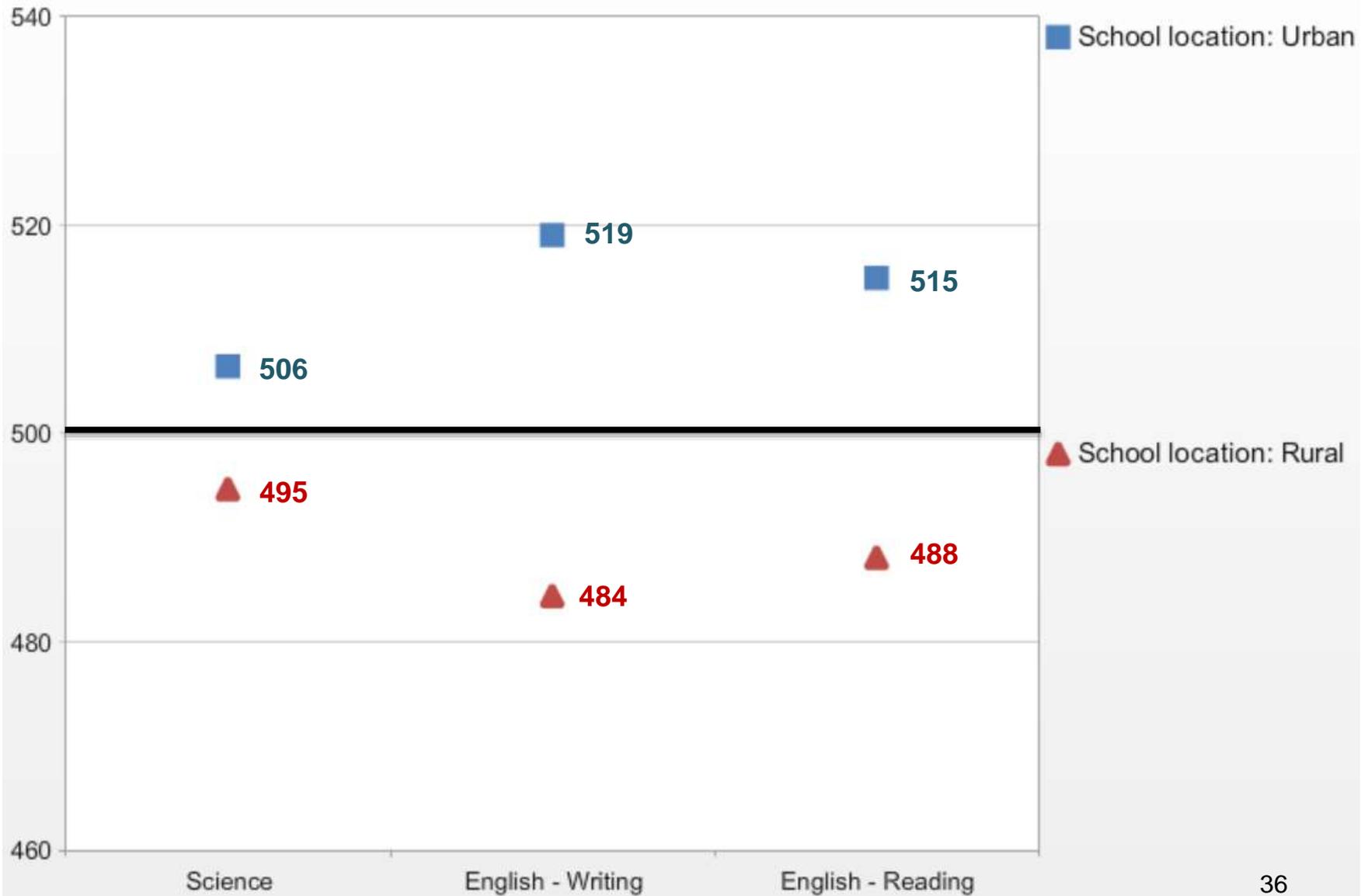
# Grade 8 –English result by nation & region (mean=500 & combined mean = 1000)



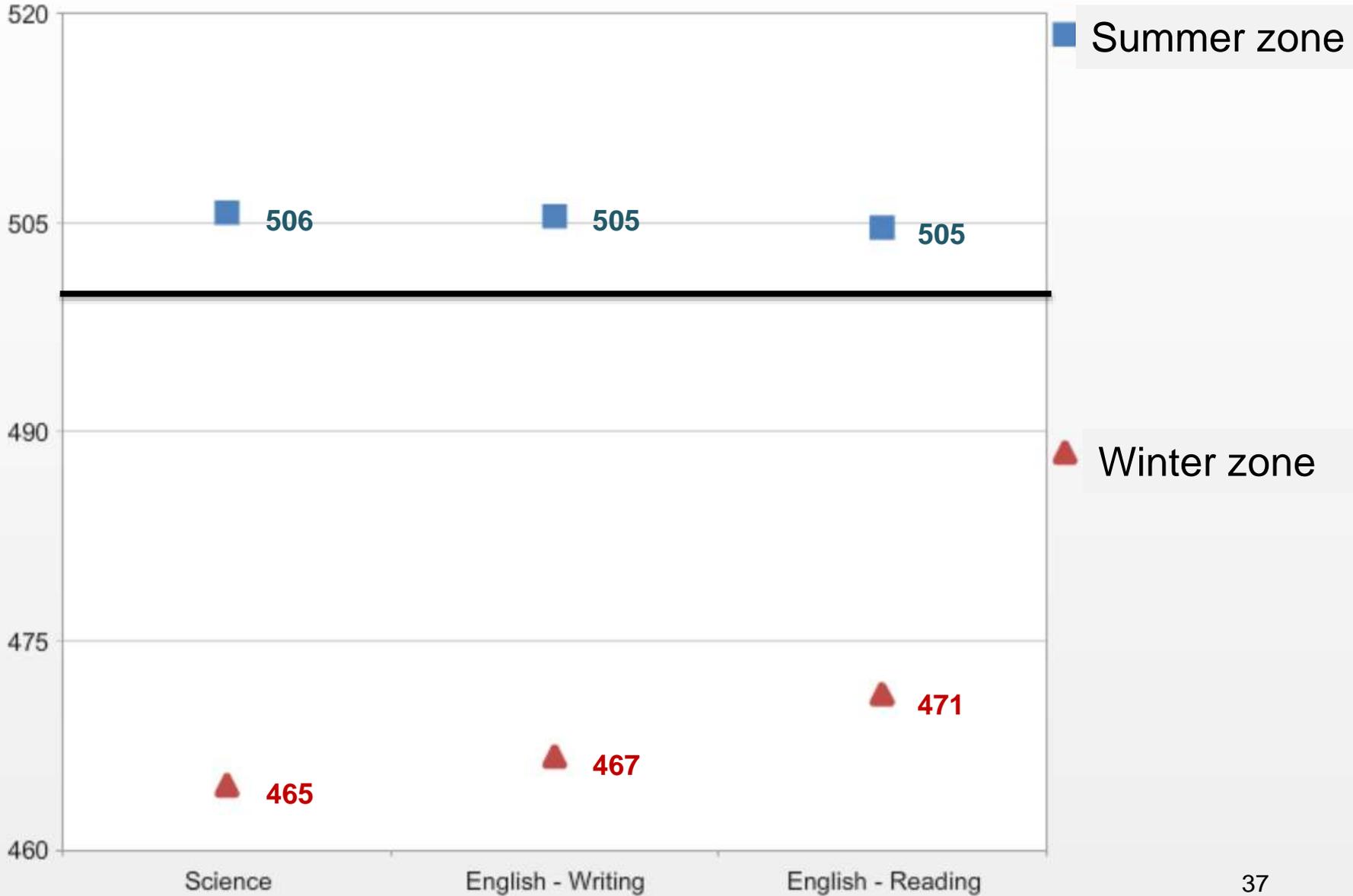
## Grade 8 – Subject results by gender (mean 500)



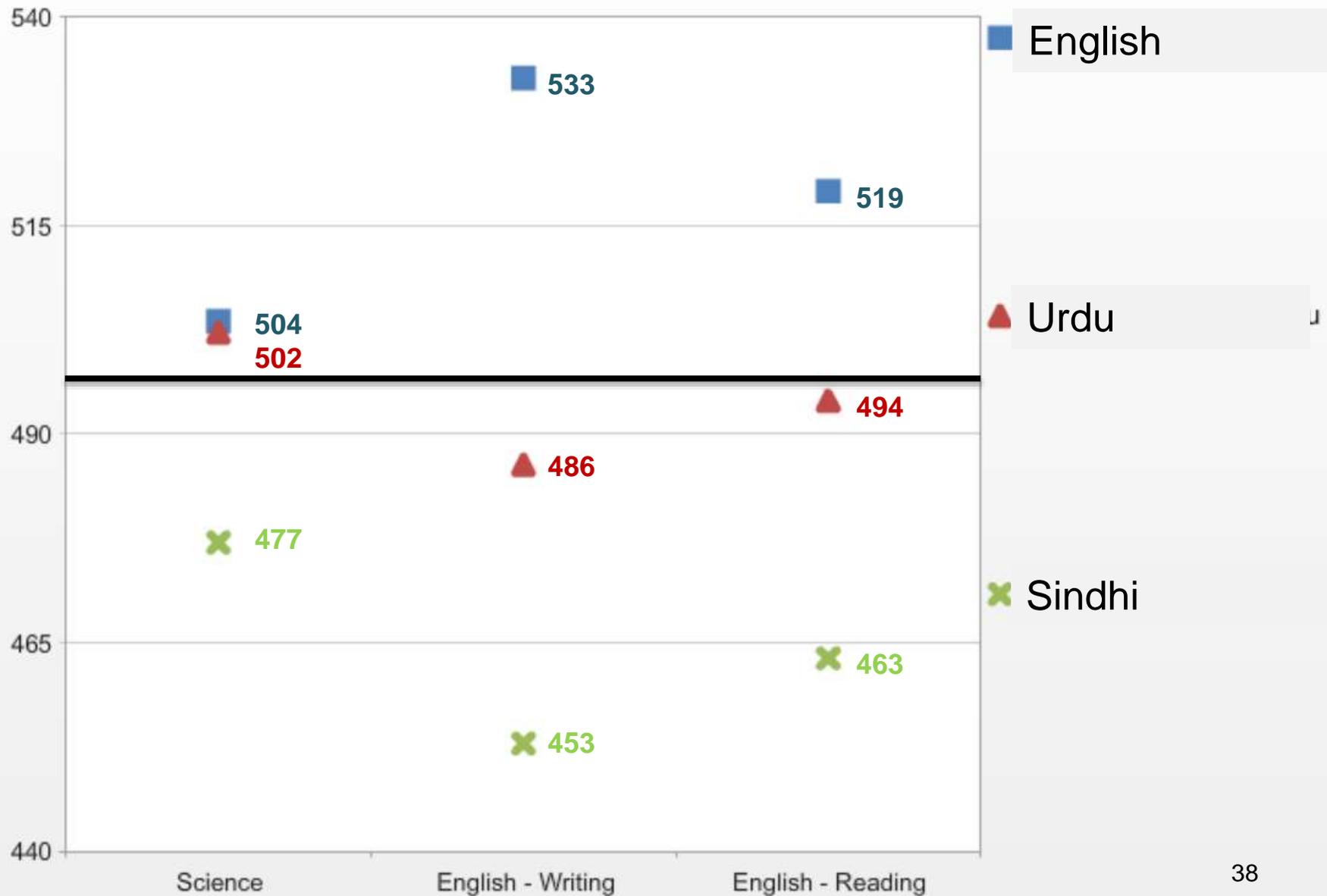
## Grade 8 – Subject results by location (mean 500)



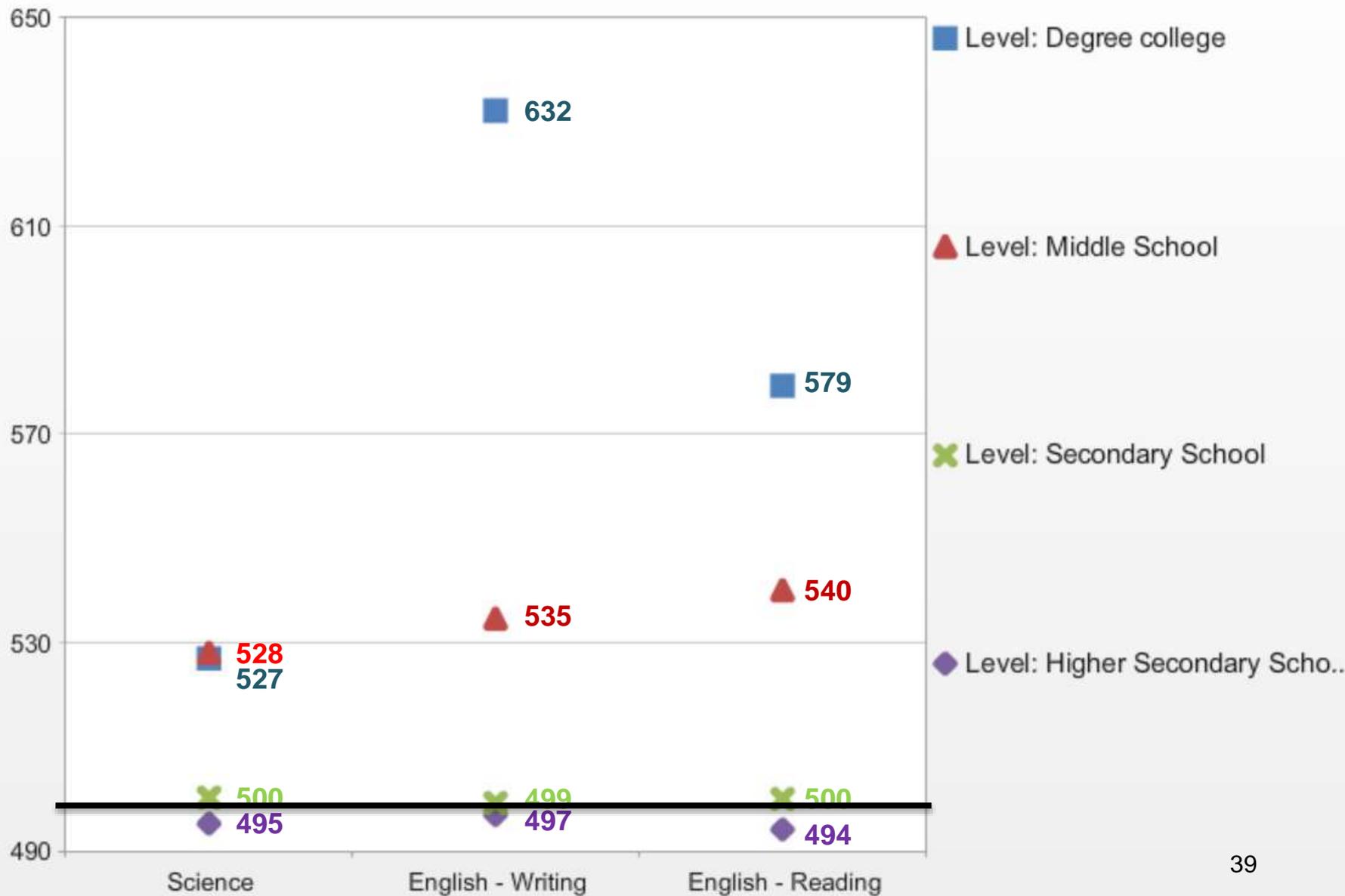
# Grade 8 – Subject results by school zone (mean 500)



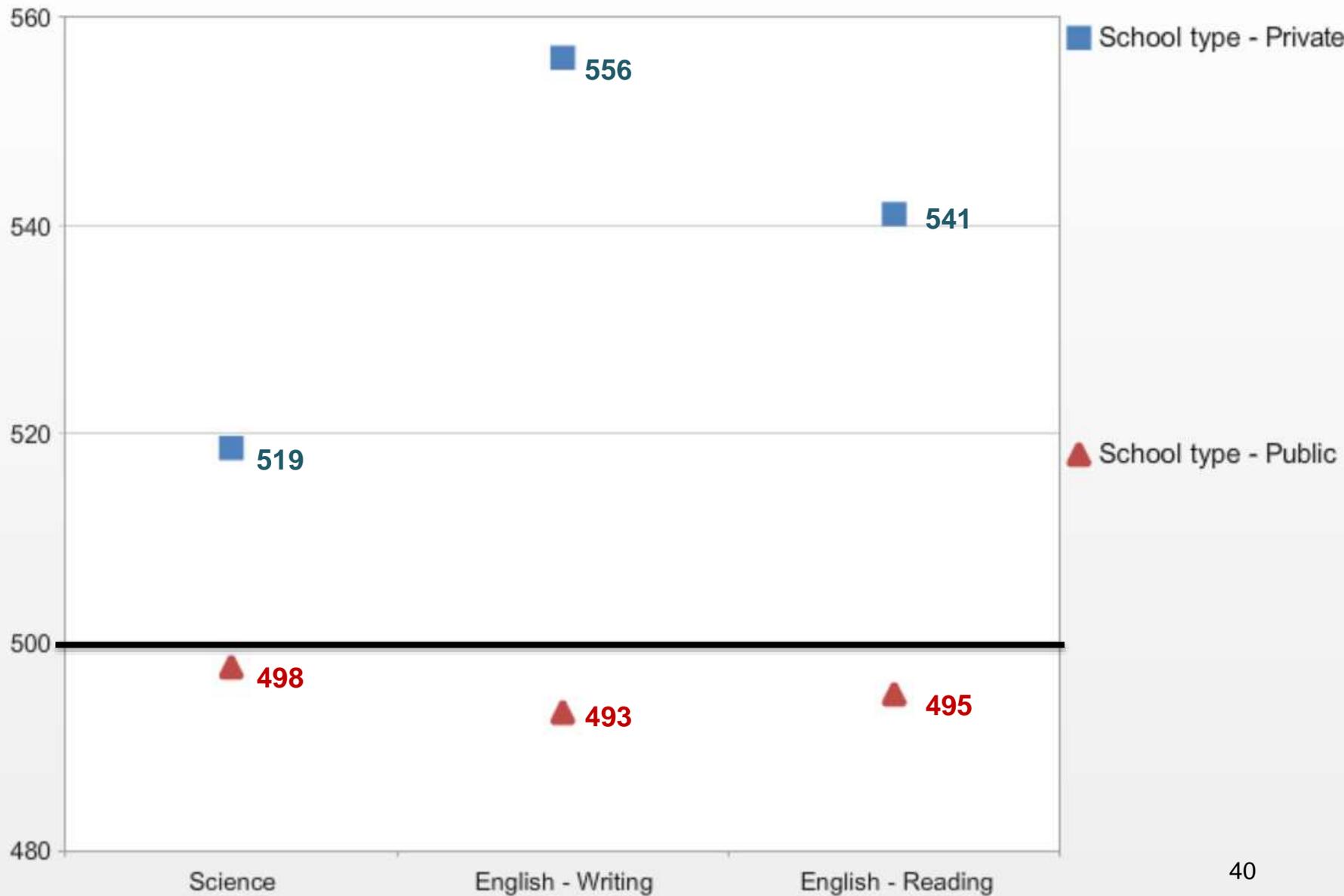
# Grade 8 – Subject results by medium of instruction (mean 500)



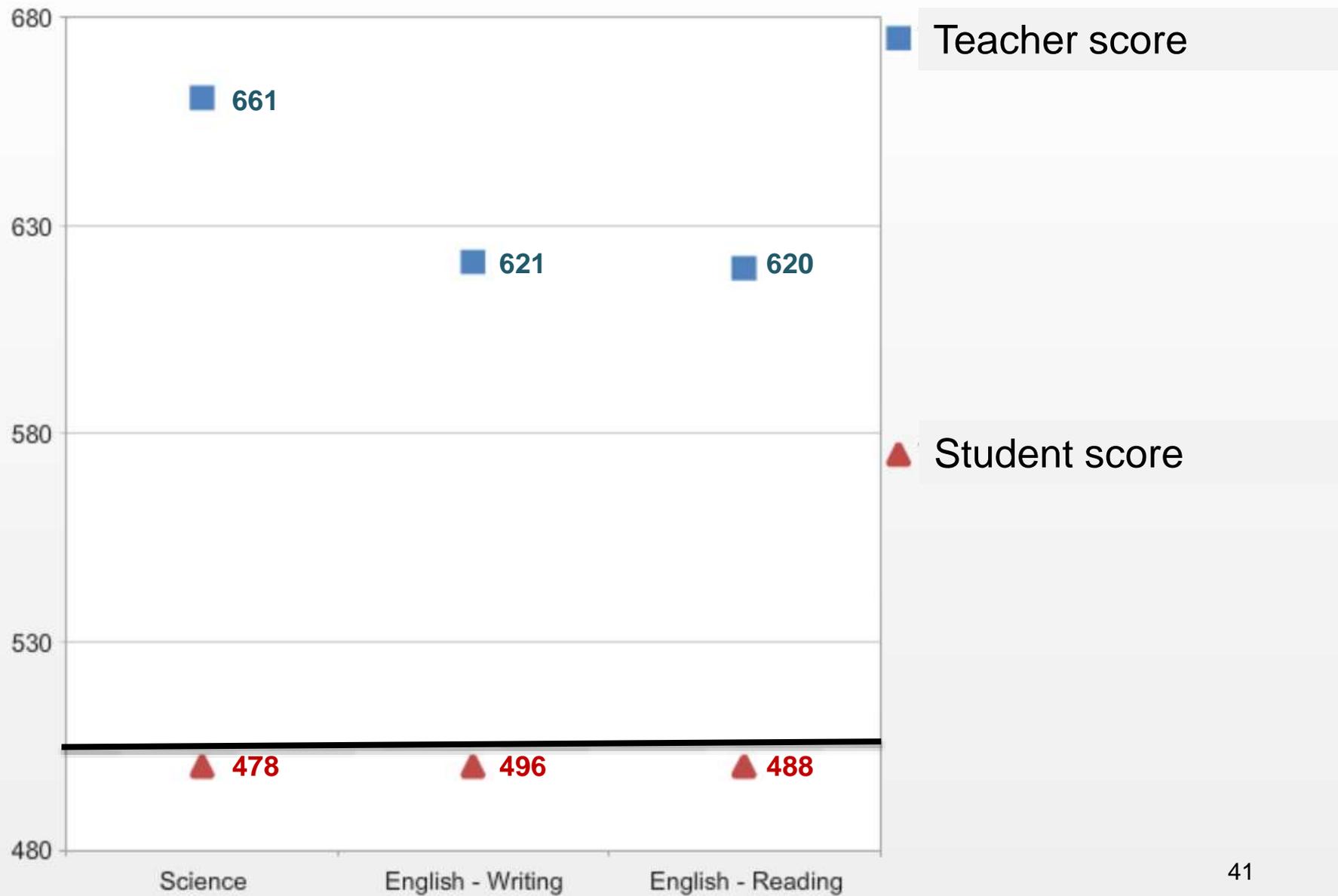
# Grade 8 – Subject results by level of school



## Grade 8 – Subject results by type of school (mean=500)

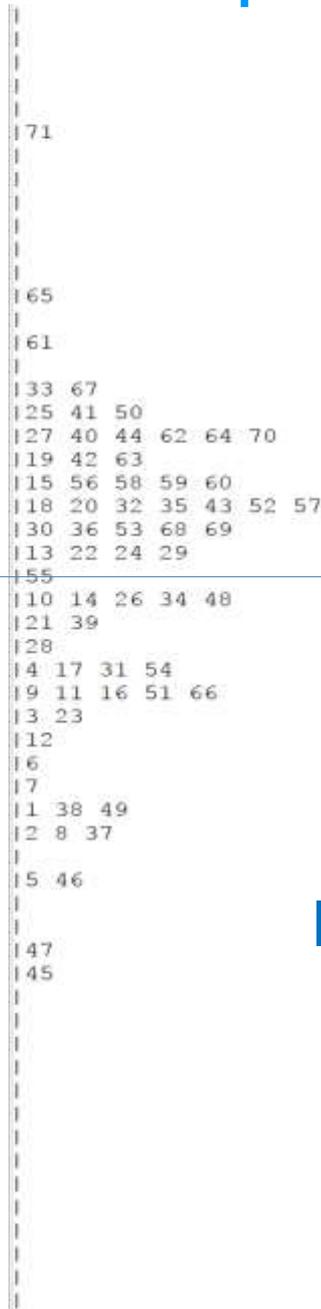


## Grade 8 – Subject results teachers & students (mean 500)



# Item-Person Map: Grade 8 Science

0



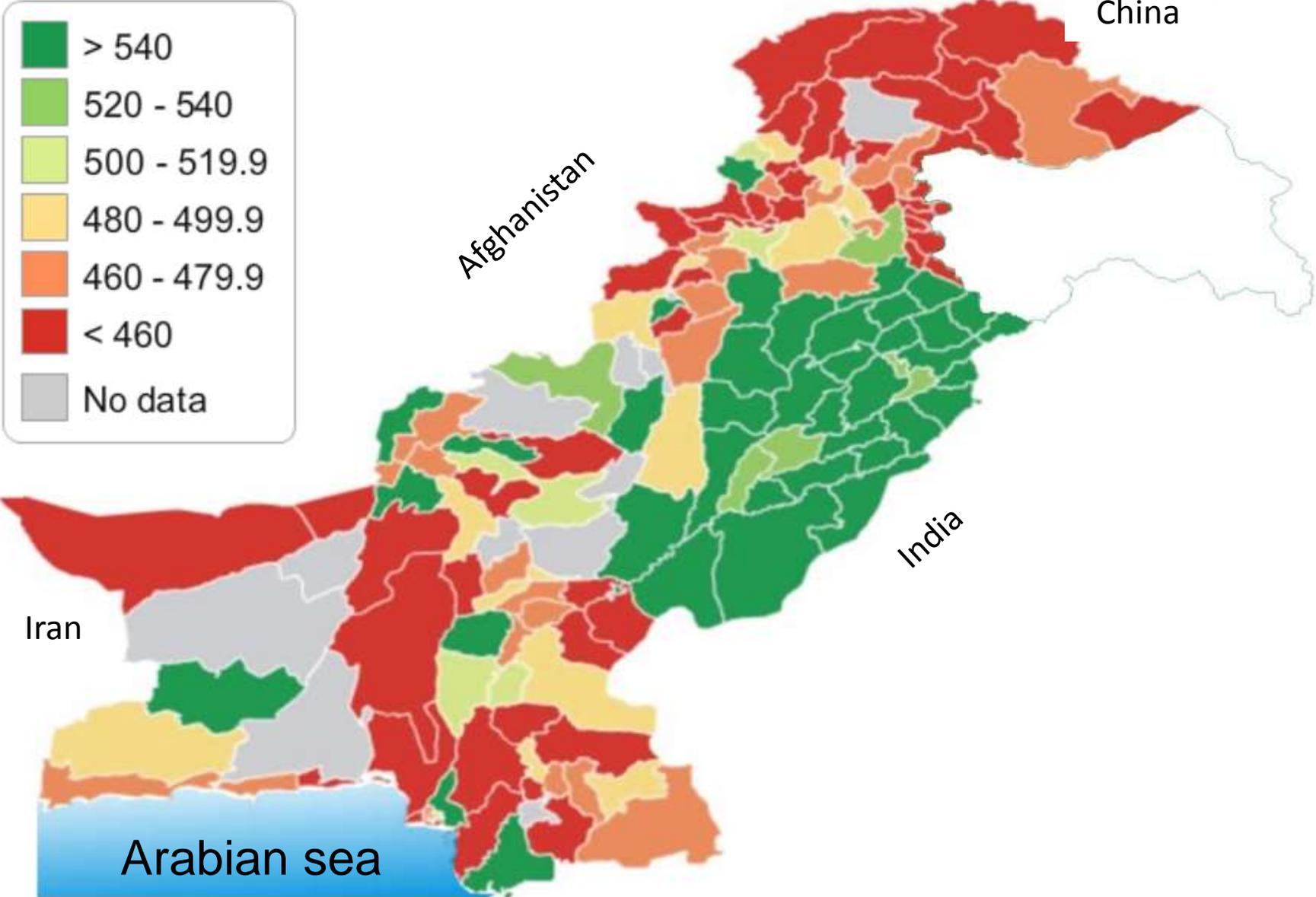
Item which were **above** average difficulty



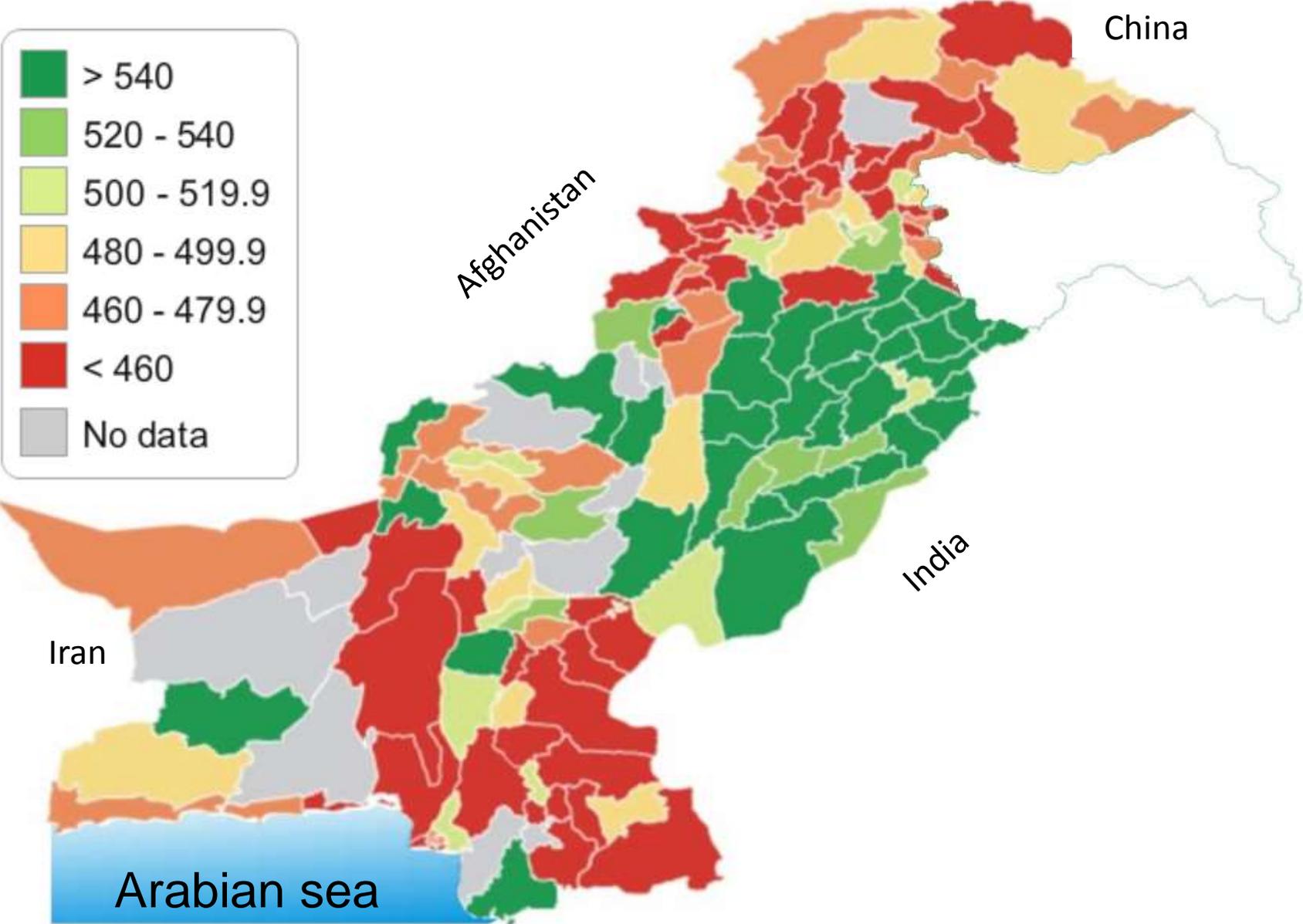
Items which were **below** average difficulty



# Grade 8 – Science (mean = 500)

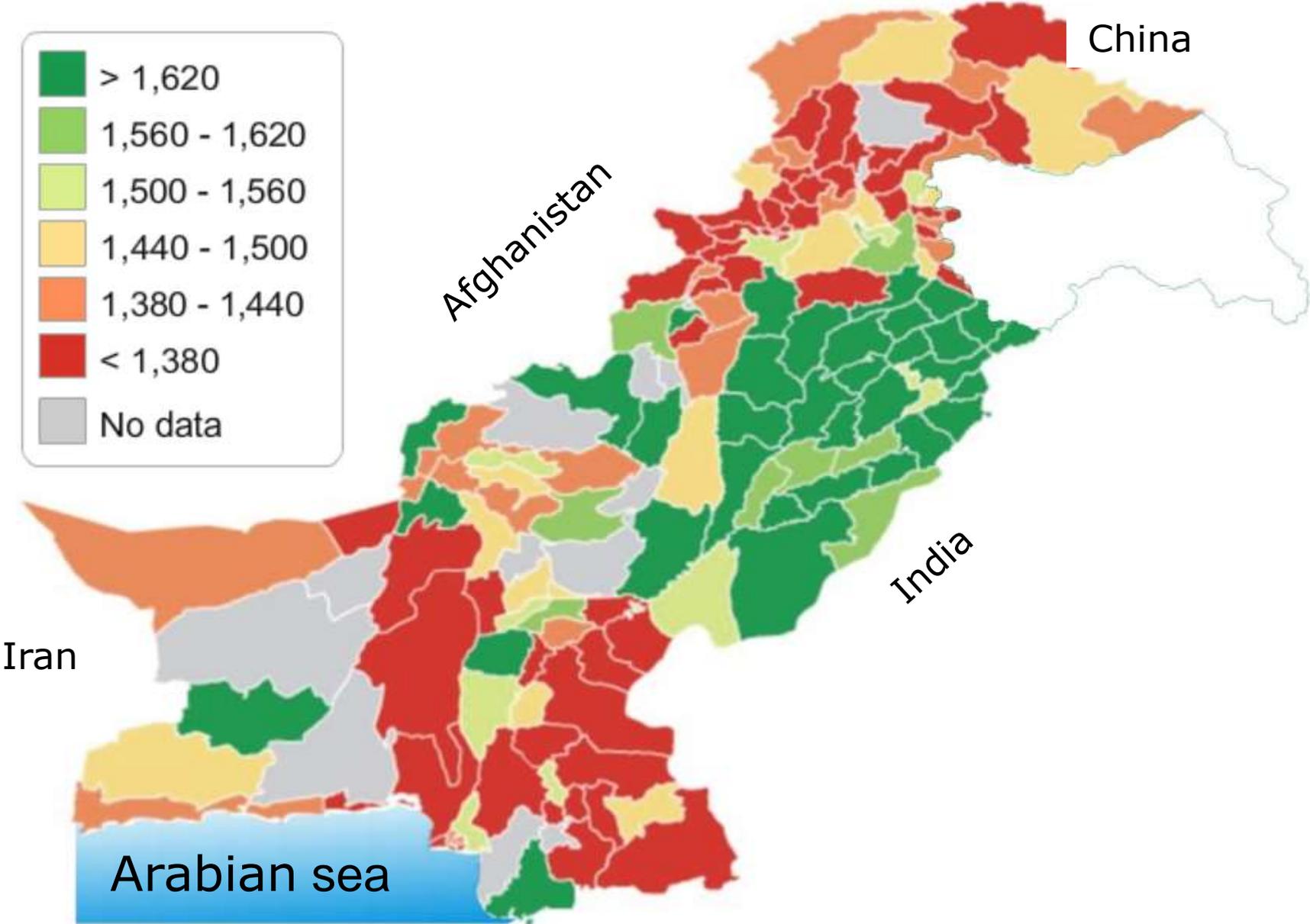


# Grade 8 – English Reading (mean = 500)





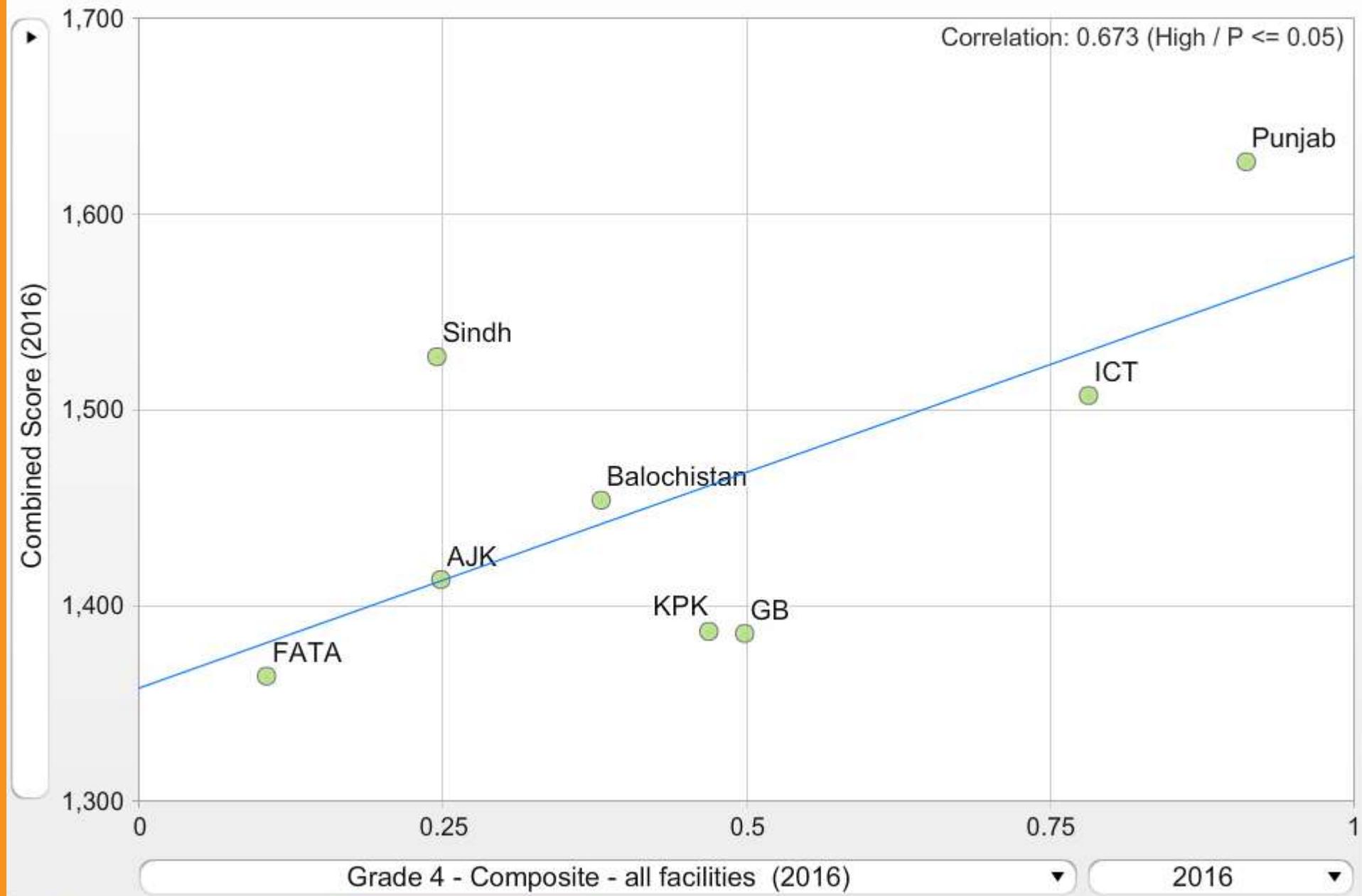
# Grade 8 – Combined (mean = 500)



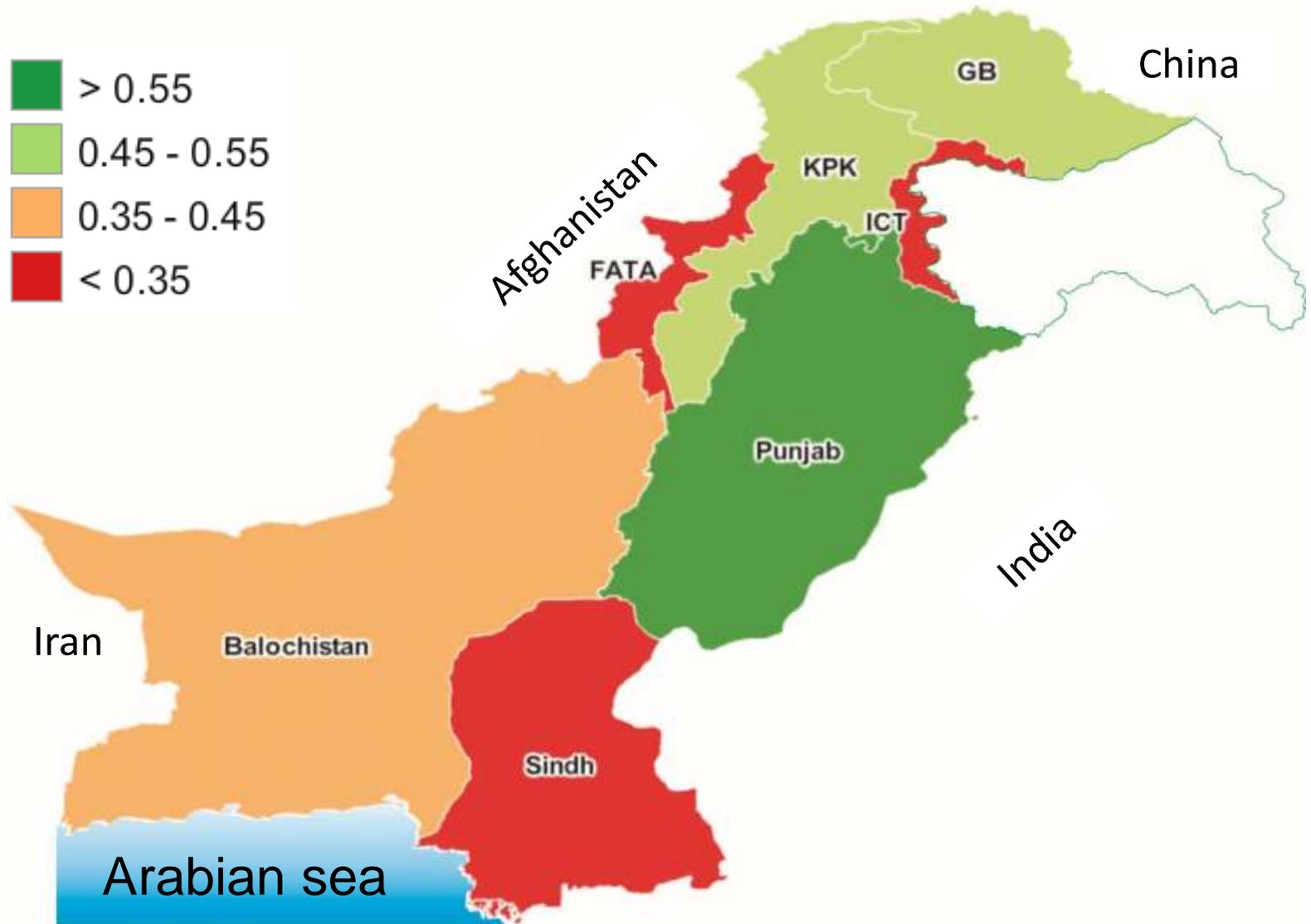
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Physical facilities Vs students score

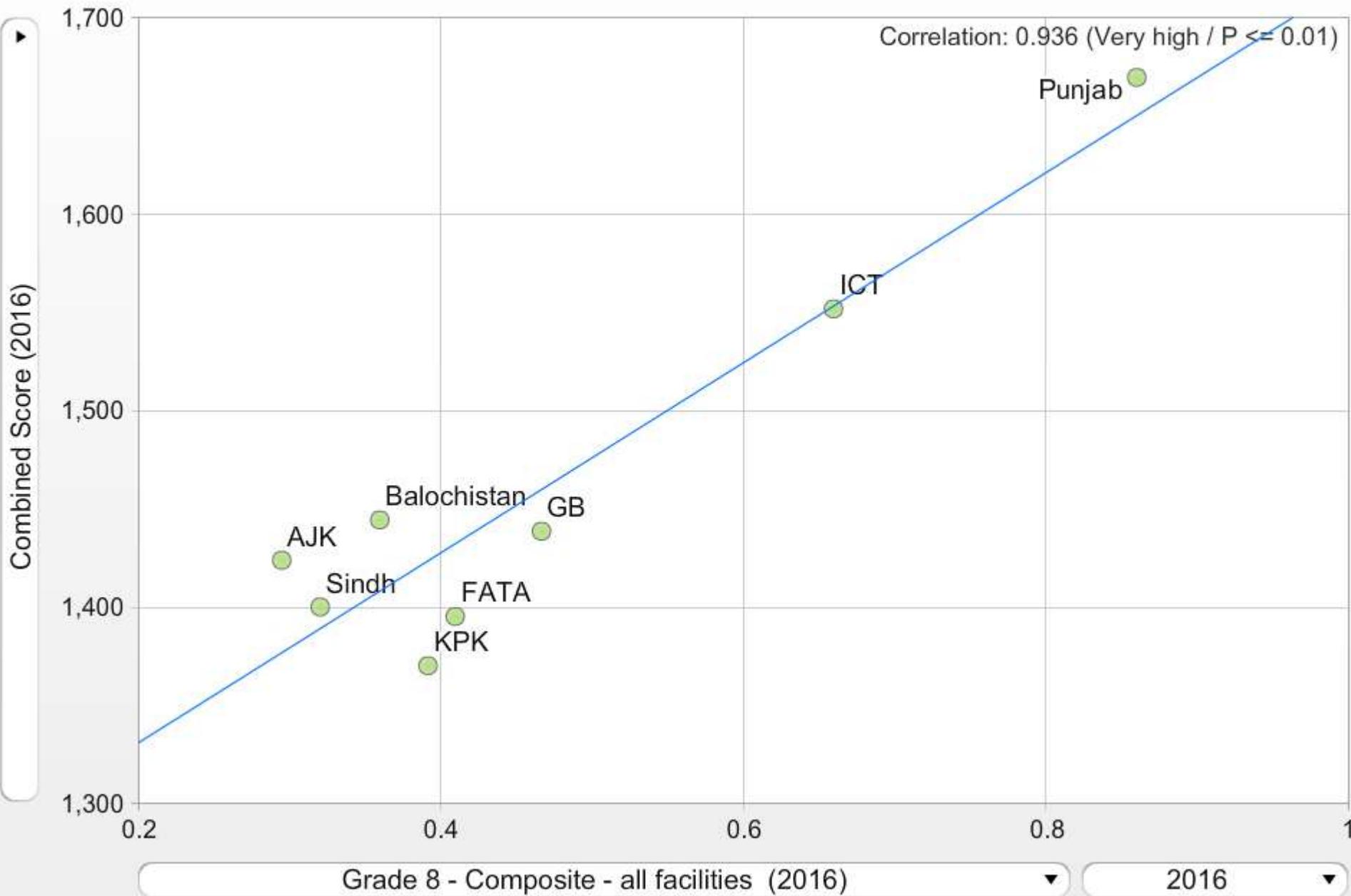
# Grade 4 - Combined score vs school facilities



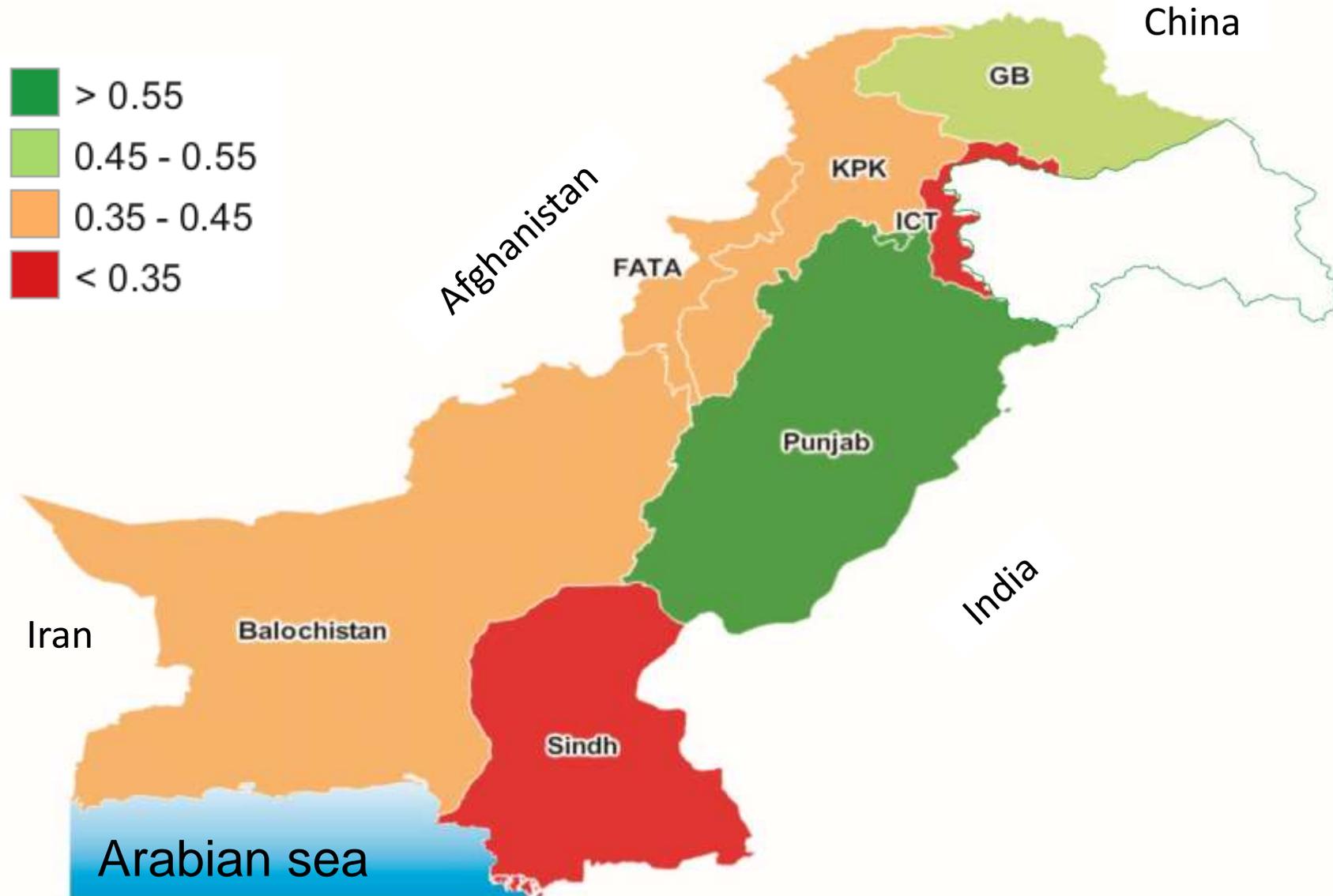
# Grade 4 – School facilities composite index



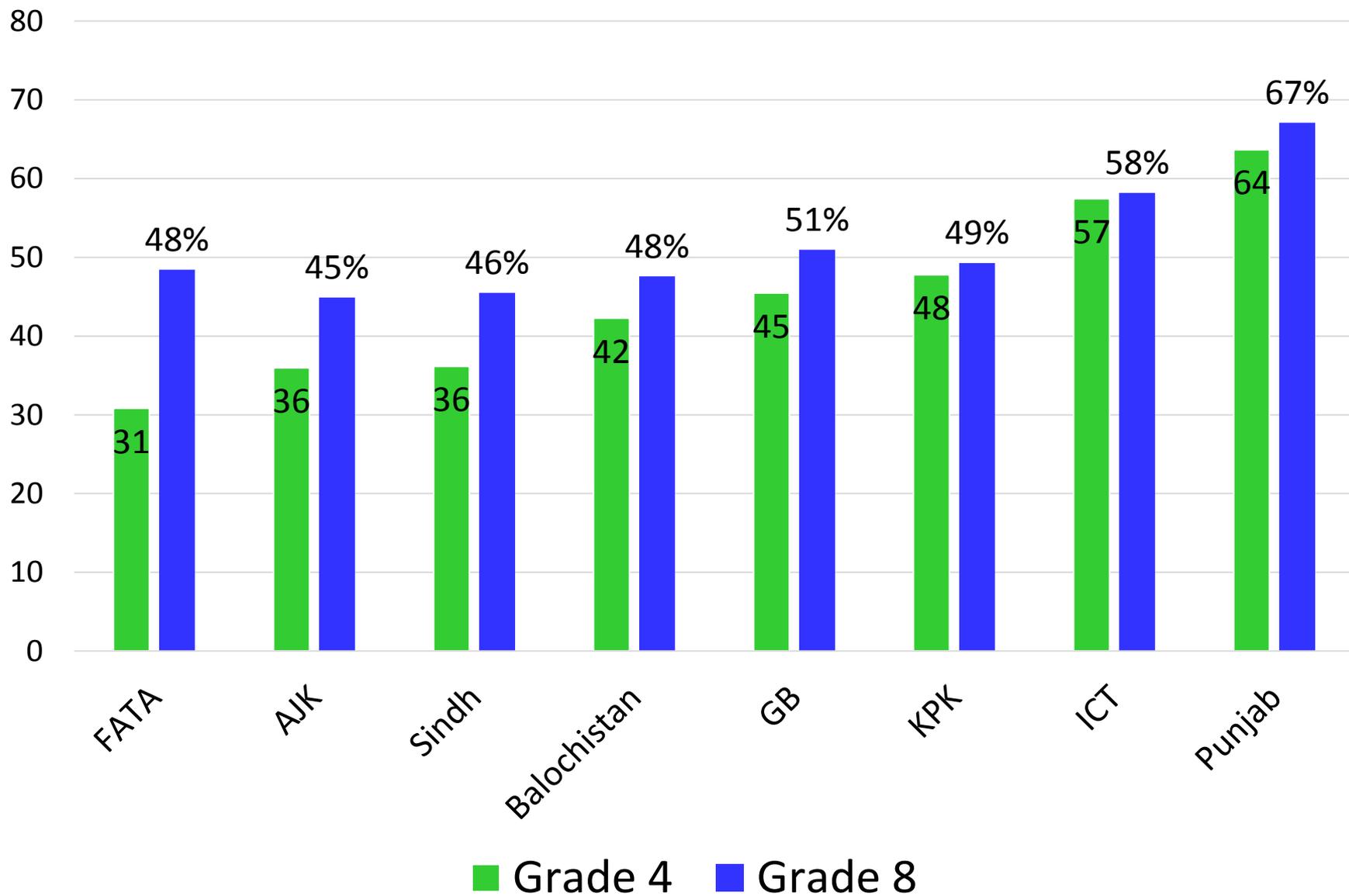
# Grade 8 - Combined score vs School facilities



# Grade 8 – School facilities composite index



# Average percentage of school facilities



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Research questions &  
HLM analysis findings

# Research questions

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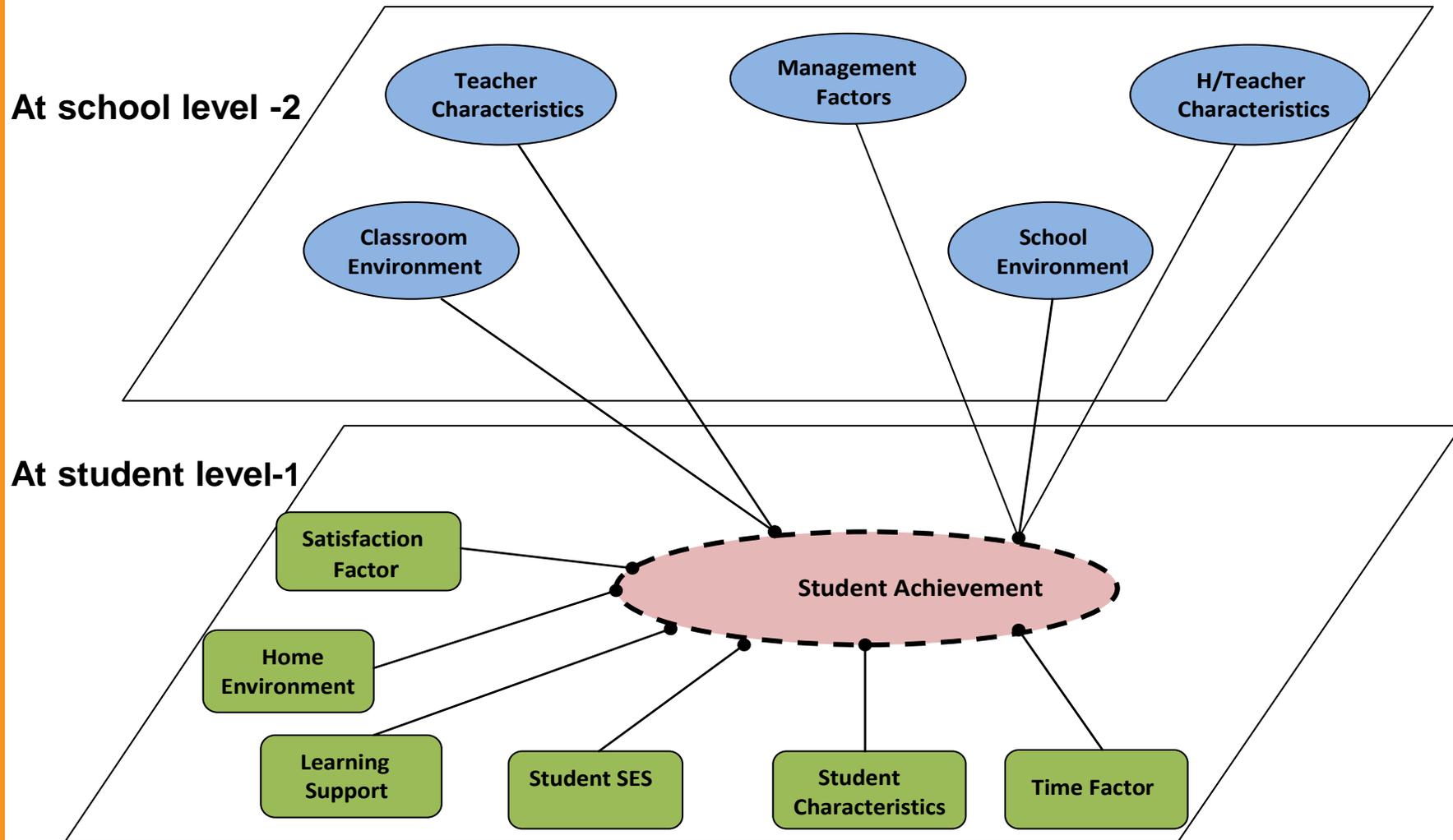
## **At Student level – Level -1**

1. To what extent are student characteristics associated with Grade 4 and Grade 8 learning achievement in Pakistan?
2. To what extent are instructional support factors associated with Grade 4 and Grade 8 students learning achievement in Pakistan?
3. To what extent are student family SES associated with Grade 4 and Grade 8 student learning achievement in Pakistan?

## **At School level –Level -2**

4. To what extent are teacher characteristics and instruction-related (classroom environment) factors associated with Grade 4 and Grade 8 student learning achievement in Pakistan?
5. To what extent are head teacher characteristics and school-related (school environment) factors associated with Grade 4 and Grade 8 student learning achievement in Pakistan?

# Two-level hierarchical linear modeling for student achievement



# Hierarchical linear modelling (HLM)

Findings at school level

# NAT 2016 – Urban-rural differences

---

Student attending school located in urban areas did better in all the subjects



As compared to the student attending schools located in rural areas.



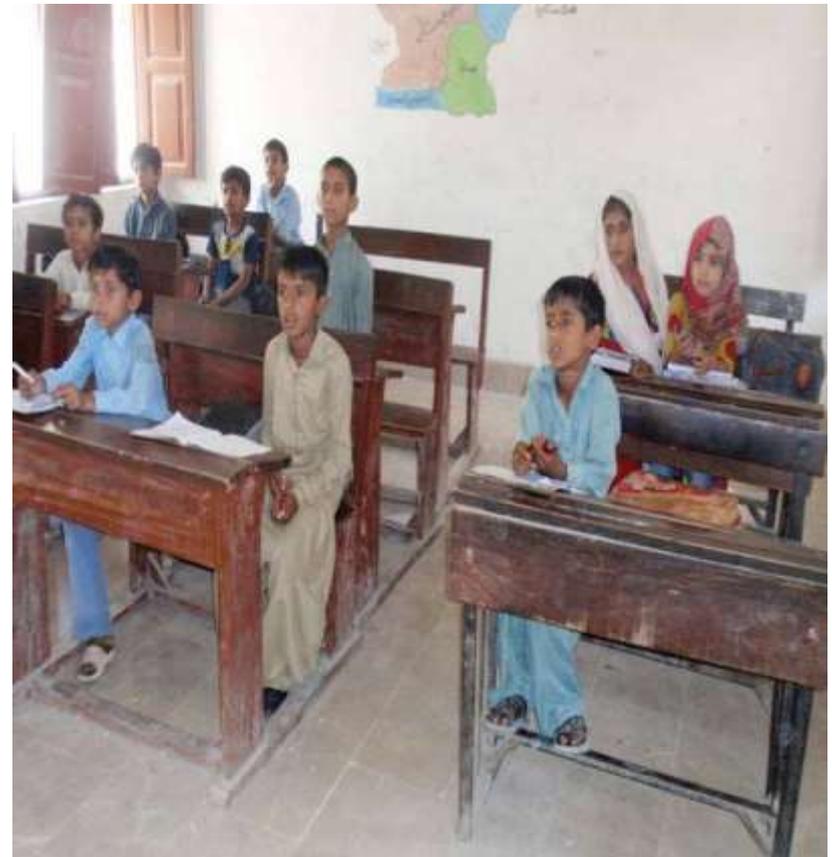
# NAT 2016 – Students Absenteeism

---

Students in schools with less student absenteeism did better in all subjects



than those in schools where absenteeism is common among students.



# NAT 2016 – Experienced school leadership

Students of such schools which have head teachers with higher years of experience performed better



Than students in schools with head teachers with fewer years of experience.



# NAT 2016 – Student involvement in co-curricular activities

Students in schools taking part in co-curricular activities significantly better

Than those students who have not in taking part in co-curricular activities.



# NAT 2016 – Course completion by teachers

Students who reported that they had completed all of the course book did better

As compared to those students who said they had not completed the course book.



# NAT 2016 – Use of local language in classroom teaching

---

Students scored worse when teachers used local language as medium of instruction/teaching at grade 8 level



As compared to those whose teachers did not use local language.



# NAT 2016 – School with boundary wall

---

Students in schools with boundary wall did better in all the subjects

than their counterparts in schools with non-functional wall or without boundary wall.



# Hierarchical linear modelling (HLM)

Findings at student level

# NAT 2016 – Student age factor

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Younger students performed better in all subjects



As compared to older students of the class.



# NAT 2016 – Books at home

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Students who had books for use at home did better in all subjects



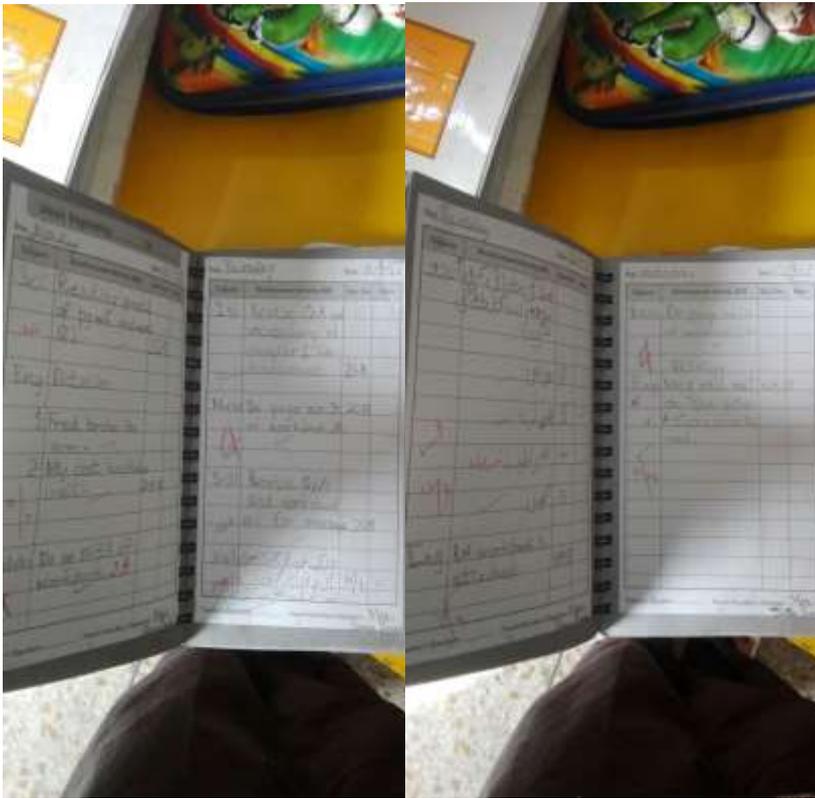
As compared to those who had no such books at home.



# NAT 2016 – Getting homework

Students in schools where teachers were given homework frequently, scored better

As compared to those who were not given homework frequently



# NAT 2016 – Checking homework by the teacher

Student who had their homework checked by their teachers more frequently did better in all the subjects

As compared to those who had homework rarely or never checked by their teachers.



# NAT 2016 – Feedback (correction) on homework

---

Students in schools where homework mistakes were pointed out by teachers scored better

As compared to those schools where such facility was not provided.



# NAT 2016 – Home possession

Students from homes with more home possession items (i.e. calculator, computer, internet, dictionary, radio, mobile phone and landline phone) did significantly better in all subjects,

When compared to student from homes with fewer home possession items.

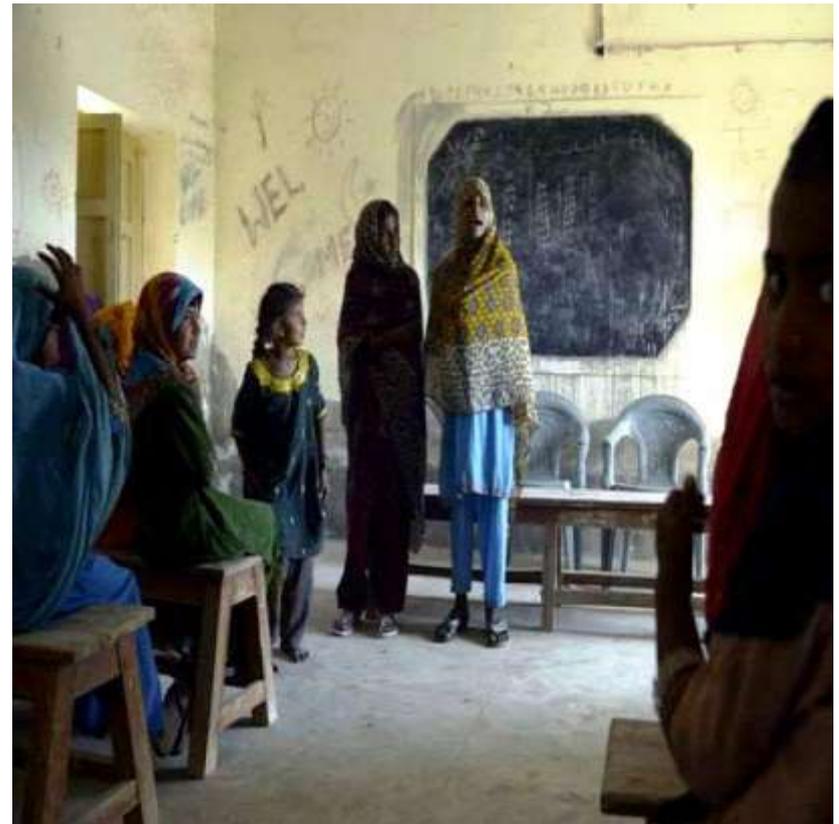


# NAT 2016 – Educated parents

Students whose parents were highly educated did better in all the subjects



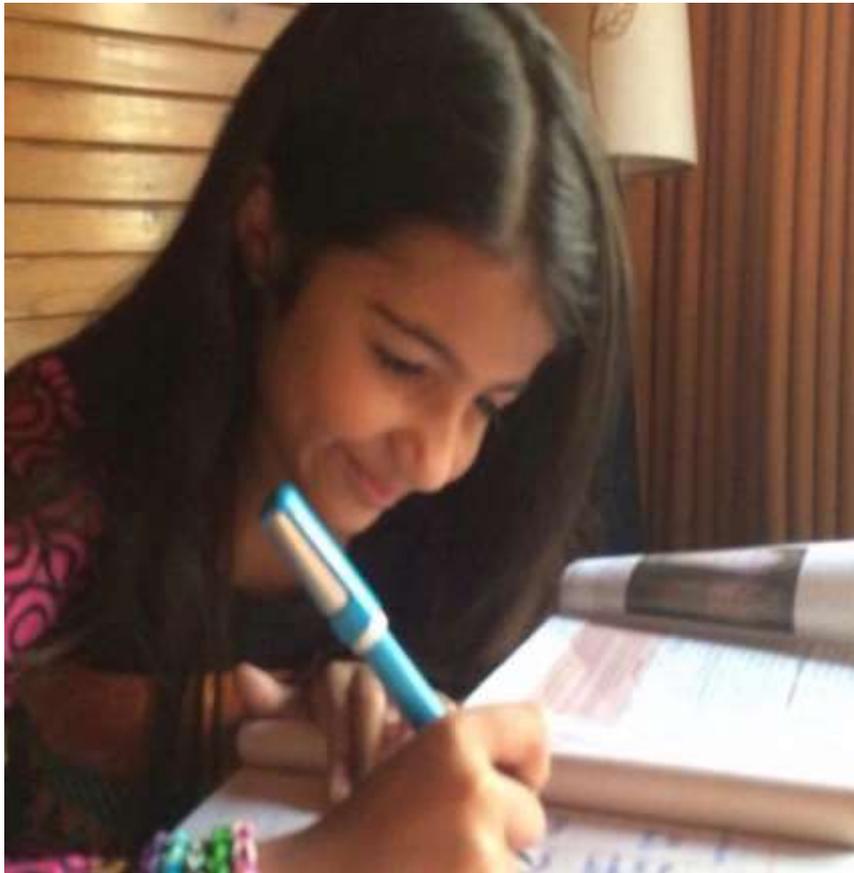
As compared to their counterparts whose parents were less or not educated.



# NAT 2016 – Paid tuition

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Students who did not take paid tuition performed significantly better



As compared to those students who took paid tuition.



# NAT 2016 – Helping parents

---

Student who said that household chores affected their school work did worse in all Students



As compared to their counterparts who said they were not involved in household work.



# NAT 2016 – Distance travel to school

Students with less travel distance to school outperformed their counterparts



Who travelled long distances to school.



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Way forward

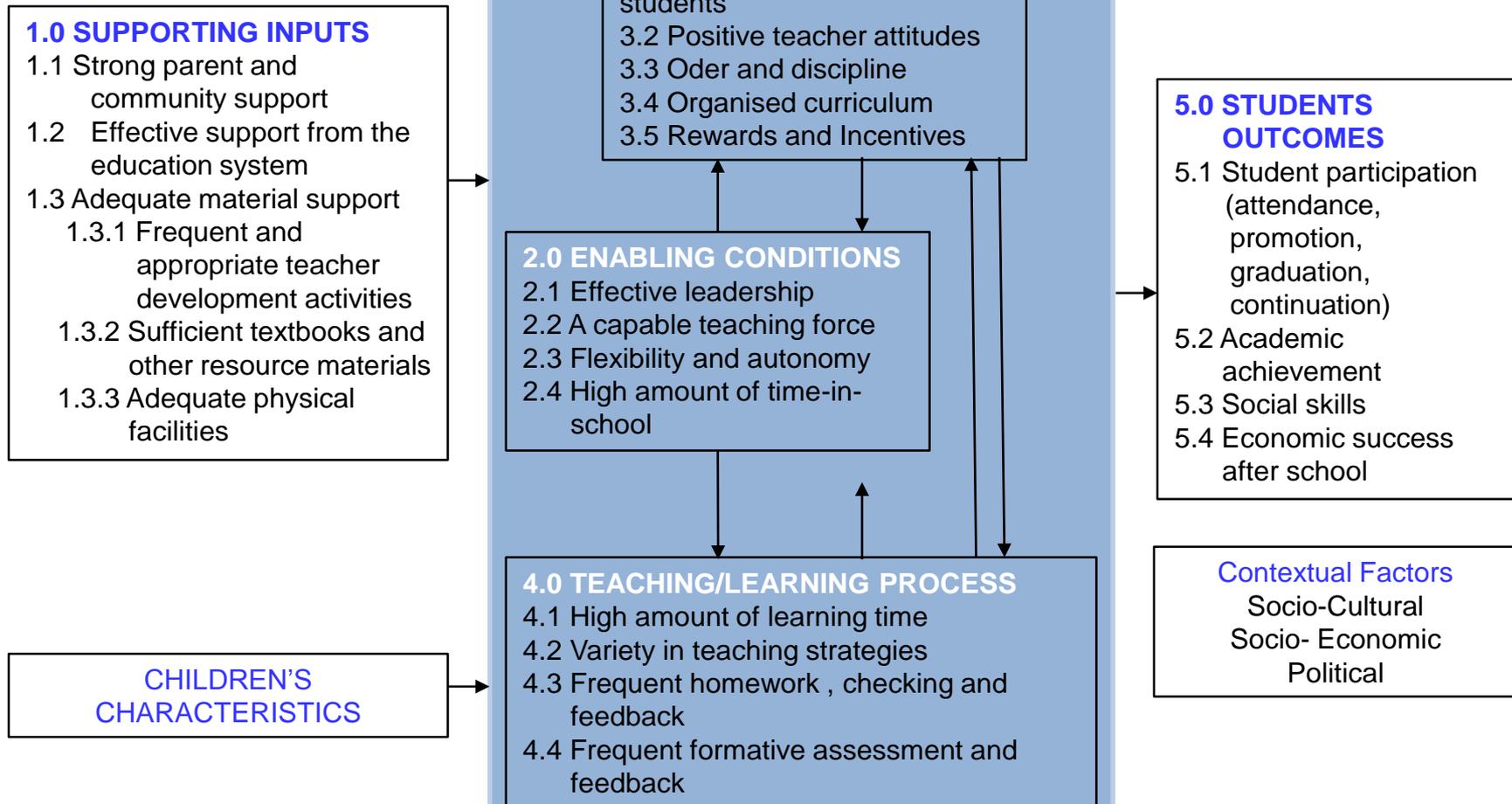
# NAT 2016 - Expenditure

#	Description – Expenditure on	Rs. In Million
1	Printing cost of assessment tools through PCPP.	4.505
2	Training of 120 Lead Master Trainers.	4.050
3	Stationary for 33,000 students	2.5
4	4.1 Test Administration Training in Provinces 4.2 Conduct of Test Administration in 1500 schools. 3.3 Monitoring of NAT	12.781
5	<b>Total Expenditure</b>	<b>23.836</b>
6	Expenditure paid till date.	19.358
7	<b>Pending claims of provinces / areas assessment centers</b>	<b>4.478</b>
8	<b>Per student cost = Rs.722.00</b>	

# Conceptual framework model: Factors influencing student learning achievement

## Outside School Factors

### Outside School Factors



# Way forward

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- Constitution of National/Provincial Task Force for implementation & monitoring of NEAS findings;
- Clear guidelines as medium of instruction in schools before TIMSS assessment;
- Conducting National / Provincial / Area level seminars for awareness purposes for sharing the NAT 2016 findings accurately;
- Conducting regional levels studies in districts where interesting findings are noticed;
- Alignment of Assessment Studies at National and Provincial level;

(Cont...)

# Way forward

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- Consultation process with provinces to ensure the correct transformation of National Curriculum SLO's into new Text Book contents;
- Inclusion of agenda point in forthcoming IPEMC regarding TIMSS
- For sustainability purposes the [Restructuring of NEAS](#) is important immediately; and,
- Rationalization of NEAS HR and technical capacity.

# Thank you for your patience

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[neaspakistan@gmail.com](mailto:neaspakistan@gmail.com)

[www.neas.gov.pk](http://www.neas.gov.pk)

[www.facebook.com/neaspakistan](https://www.facebook.com/neaspakistan)