

E-assessment Innovations for the 21st Century

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now you know

Content of my presentation:

- Assessment in the classroom
- Computer based testing
- Formative Assessment in The Netherlands
 - Student Monitoring System (SMS)
 - Math Garden
- Project Kazakhstan (formative assessment)



Why assessment

- Assessment is an important part of learning:
 - Information about progress
 - Monitoring intended level
- Functions of assessment:
 - For the student
 - For the teacher
 - For the school
 - For the parents
 - For the society



How to assess

What is the purpose?

- Summative - High stakes (certificate)
- Formative - Low stakes (diagnostic, classroom assessment)

(When the cook tastes the soup, that's formative. When the guests taste the soup, that's summative)



Why CBT?

- Controlled delivery (higher security)
- Scoring by computer/ independent marking
- Immediate feedback
- Logistic benefits
- Adaptive testing
- More resources (databases, applications, etc.)
- Nonverbal item types (e.g. hotspot, drag and drop)
- More attractive (multimedia, interactivity, etc.)
- Saving money?



WINTERSPORTS

Below are the rates of 'Sneeuwwereld'.

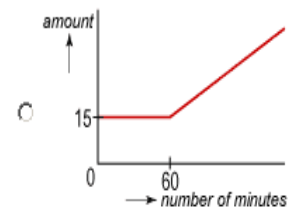
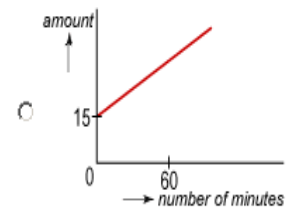
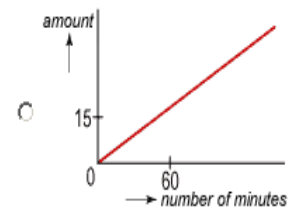
SNEEUWERELD	
per child	
lane rental 1st hour	€ 12.00
per minute longer	€ 0.25
day ticket	€ 20.00
per adult	
lane rental 1st hour	€ 15.00
per minute longer	€ 0.30
day ticket	€ 24.75

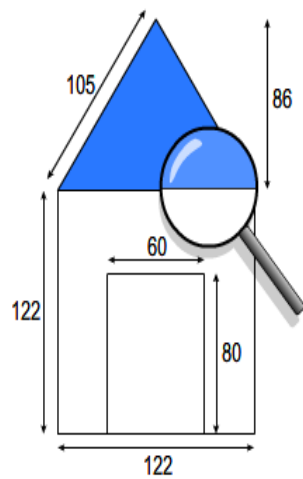


Below you see 3 graphs.

One of these belongs to the amount in euros an adult would have to pay for skiing a number of minutes at 'Sneeuwwereld'.

Which graph is it?



**Play house**

Above you see a drawing of the front of this play house.
The measurements listed with it are in cm (centimetres)

How tall is the play house? cm

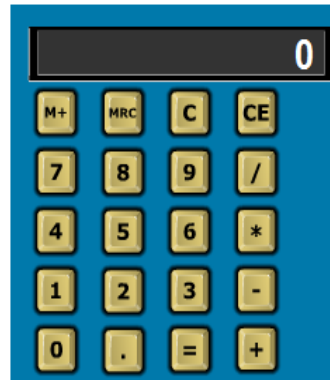
**Amount of blood**

The amount of blood someone has depends among others on his height and his weight.
By adjusting the sliding bars correctly, you can determine the amount of blood of a specific person.

Weight (kg) = 50

Length (cm) = 150

Amount of blood (ml)



Johan is 23 years old and a blood donor.
He weighs 75 kg and is 180 cm tall
Upon a visit to the blood bank 500 ml of blood is drawn from Johan.

**How much blood does his body contain right after this blood has been drawn?
If needed use the calculator.**

ml



High blood pressure

Smoking, obesity and certain eating habits can result in high blood pressure.

BMI is a number that depends on the length and weight of a person.
It indicates whether a person has a low weight, normal weight or overweight.

Next to this you can calculate the BMI by adjusting the sliding bars correctly.

BMI-calculator

Length  168 cm

Weight  65 kg

BMI = **23**



Less than 18.5 low weight
18.5 <--> 25 normal weight
overweight

Amy weighs 65 kg and is 168 cm tall
She has high blood pressure

Is Amy's high blood pressure caused by overweight?

- Yes
- No, she has a normal weight
- No, she has a low weight



Image 1



Image 2

In illustration 1 you see a picture of the scene of a mediaeval passion game with at the far left heaven and on the right hell. In between are all sorts of places that belong in the passion game, like the temple of Jerusalem.

Illustration 2 is a detail with only hell, indicated in the illustration with the French word l'enfer.

In the Middle Ages hell was often illustrated in a way recognizable to everyone.

Describe five aspects of the scene on illustration 1 (2) from which hell can be recognized. (2 pt)



The way the stars earned their money

"Today my name is plastered all over the newspapers, but I was 10, I was merely the kid who had to deliver them. And it rained all the time."

CHAD MURRAY



You're calling people who don't want you to call. You put on your best fake voice and try to sell them pens with their names on them. I only had success once."

JOHNNY DEPP



"Me and my cousins always baby-sat. I knew what to do with them because I was the same kind of kid. I acted like a big brother with kids."

CHRIS BROWN



On the side are a few stars who talk about the side jobs they used to have.

Who is positive about his side job?

- Chad Murray
- Johnny Depp
- Chris Brown
- Kelly Clarkson
- Zac Efron



text



Read the text.

The late mediaeval play *Elckerlijc* is a *Memento Mori* in the form of a theatre play. The play was not just performed during the middle ages, but even into the twentieth century.

In the illustration you see the then famous actors Verkade (left) and Royaards (right) as Die Doot and Elkerlijc in a play from 1907. The Prinsenhof in Delft was the stage for the annual play of *Elkerlijc* from 1950 through 1971.

Name one reason why the mediaeval play *Elkerlijc* was performed so often. (1 pt)



Waarop monteert je het snijgereedschap bij de freesmachine?

- op de beitelas
- op de freesspil
- op de horizontale as
- op de trappenschijf

More emphasis on formative assessment



Day-to-day assessment

Types and formats of classroom assessment:

- interacting during lessons (asking questions)
- exercises and assignments
- observations
- marking written work
- teacher made tests
- portfolio
- etc.



Two types of mistakes in judging:

- **Instability:**
 - different judgements from one case to the next
- **Lack of intersubjective conformity:**
 - one teacher assesses differently compared to another teacher

General Characteristics

- Tests for important core skills
- Monitors the progress of pupils throughout their school careers
- Textbook independent
- Built on national curriculum
- Based in Item Response Theory

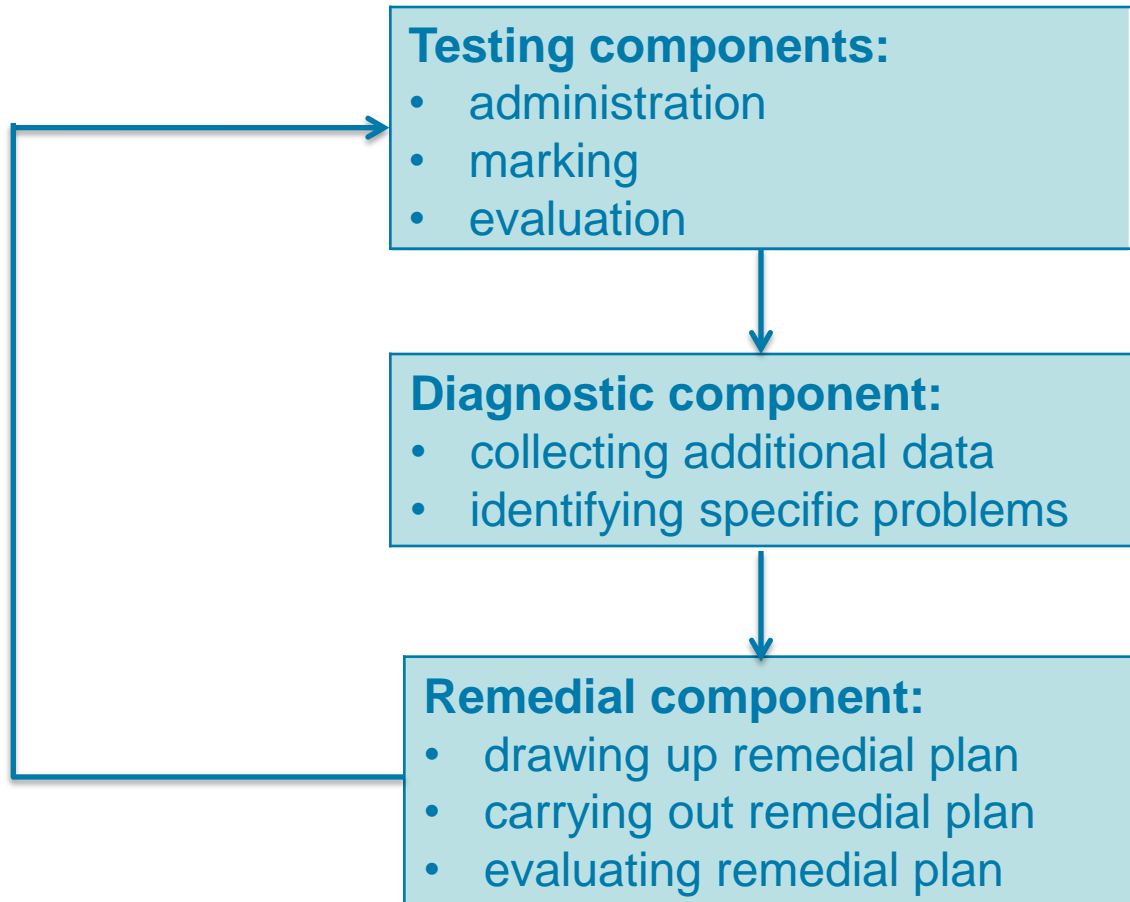
Content SMS(2)

Consists of:

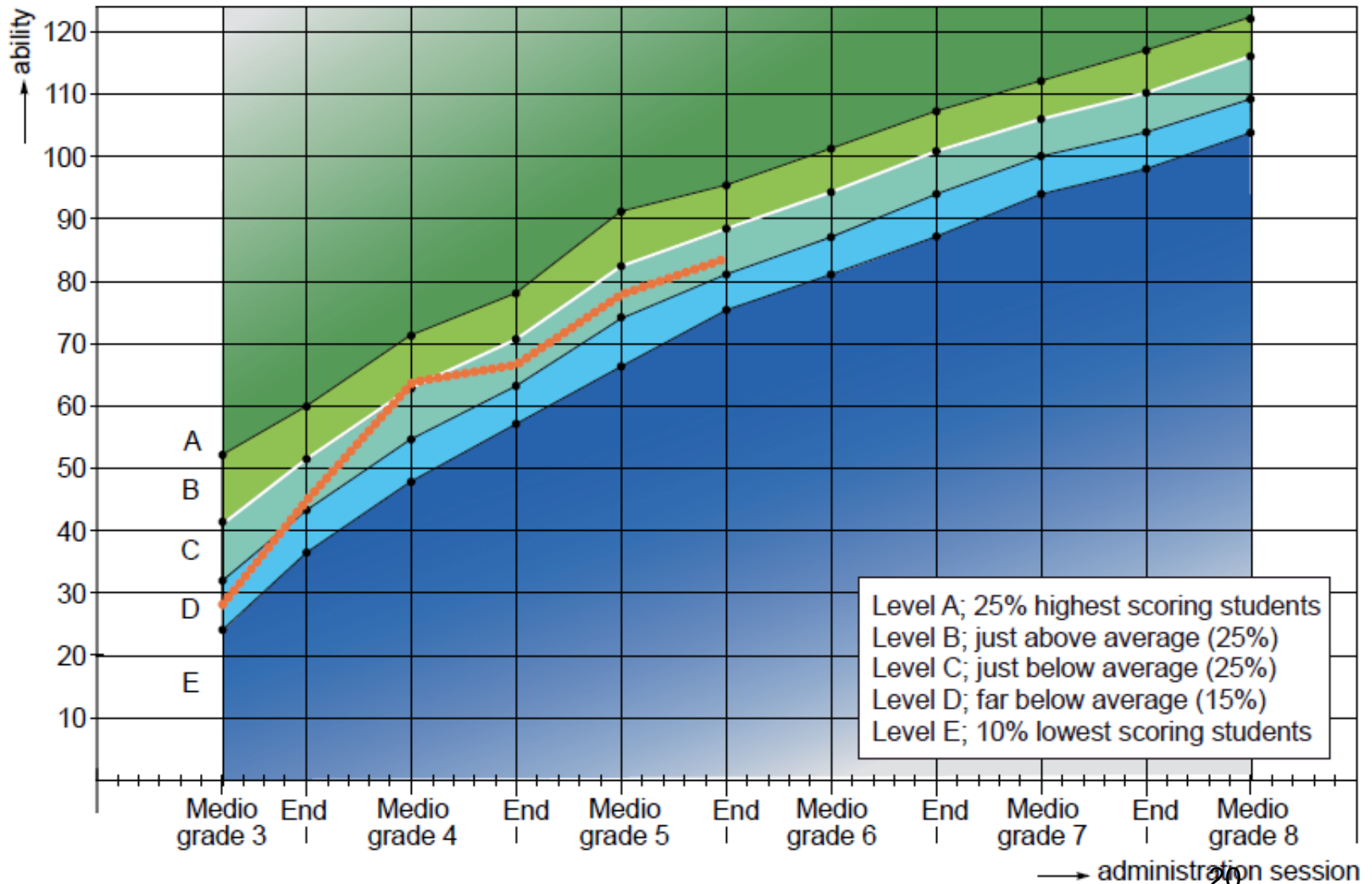
- a system for manual or automated registration of pupil progress:
 - pupil (detail, longitudinal)
 - grade or class (overview)
 - school (self evaluation)
 - group of schools (supervision)
- means for analysing learning problems
- suggestions for remedial teaching



Components SMS



Student Report



Schools compared (1)

Bestuursoverzicht afnamemoment LVS Gemiddelde vaardigheidsscores

Schooljaar: 2010-2011

Cito | Volgstelsel primair onderwijs
Bovenschoolse rapportage

Groep 4 - Medio

	Begrijpend lezen 2011		Rek-Wisk 2011		Spelling 2011		TL Leestempo	
	LIn afn./tot.	Gem.	LIn afn./tot.	Gem.	LIn afn./tot.	Gem.	LIn afn./tot.	Gem.
Landelijk gemiddelde		9,0		48,0		119,0		60,0
Inspectienorm < 15%		-		45,0		-		57,0
School 01	52 / 53	17,0	52 / 53	59,8	52 / 53	120,9	52 / 53	64,4
School 02	50 / 57 !	14,1	52 / 57	49,3	51 / 57 !	120,2		
School 03	36 / 37	8,8	37 / 37	51,3	37 / 37	119,6	37 / 37	69,1
School 04	40 / 41	18,8	40 / 41	57,4	40 / 41	124,3	40 / 41	62,7
School 05	43 / 46	4,7	43 / 46	45,8	43 / 46	119,8		
School 06	30 / 32	7,1	30 / 32	54,2	30 / 32	120,9		
School 07	15 / 16	15,7	15 / 16	61,2	15 / 16	124,2	15 / 16	69,6
School 08	36 / 37	15,9	36 / 37	51,1	36 / 37	120,9	36 / 37	55,8
School 09	58 / 65 !	4,1	60 / 65	39,0	59 / 65	119,3	59 / 65	68,1
School 11	21 / 23	15,4	21 / 23	46,0	20 / 23 !	120,0		
School 12	22 / 22	15,8	22 / 22	56,3	22 / 22	123,3	22 / 22	70,8
School 13	20 / 22	7,9	21 / 22	39,3	20 / 22	115,6		
School 14	61 / 65	10,3	61 / 65	47,2	61 / 65	118,3	61 / 65	62,2
School 15	81 / 82	13,0	82 / 82	48,9	82 / 82	119,7		
School 16	39 / 39	13,6	39 / 39	56,3	39 / 39	121,5	39 / 39	79,0
Bestuur		11,8		50,2		120,3	21	66,2

Schools compared (2)

Bestuursoverzicht trend LVS Gemiddelde vaardigheidsscores

Cito | Volgstelsel primair onderwijs
Bovenschoolse rapportage

Toets: Rek-Wisk 2011

Groep 4 - Medio	2008-2009		2009-2010		2010-2011	
	LIn afn./tot.	Gem.	LIn afn./tot.	Gem.	LIn afn./tot.	Gem.
Landelijk gemiddelde		48,0		48,0		48,0
Inspectienorm < 15%		45,0		45,0		45,0
School 01	33 / 34	57,5	48 / 49	59,8	52 / 53	59,8
School 02	54 / 55	49,7	57 / 57	52,0	52 / 57	49,3
School 03	43 / 44	48,9	36 / 36	48,4	37 / 37	51,3
School 04	44 / 45	61,7	41 / 41	55,0	40 / 41	57,4
School 05	54 / 57	51,0	37 / 39	52,2	43 / 46	45,8
School 06	35 / 39 !	48,7	33 / 33	50,2	30 / 32	54,2
School 07	18 / 18	47,2	15 / 15	44,7	15 / 16	61,2
School 08	44 / 45	48,1	29 / 29	53,2	36 / 37	51,1
School 09	50 / 51	43,0	46 / 49	35,8	60 / 65	39,0
School 11	22 / 28 !	44,8	18 / 20	51,7	21 / 23	46,0
School 12	17 / 17	63,6	26 / 27	58,0	22 / 22	56,3
School 13	19 / 25 !	43,8	19 / 21	32,4	21 / 22	39,3
School 14	63 / 69	46,5	73 / 78	46,0	61 / 65	47,2
School 15	54 / 59	56,1	107 / 110	47,6	82 / 82	48,9
School 16	36 / 37	59,3	45 / 46	59,1	39 / 39	56,3
Bestuur		51,1		49,9		22 50,2

Self-organizing adaptive practice and monitoring tools



Math Garden

Oefenweb & University of Amsterdam



now you know

Background ideas

1. The cognitive system in development is a complex system
 - *Daily measurements*
2. Arithmetic and language learning are instances of cognitive expertise
 - *Lots of (adaptive) practice, direct feedback (deliberate practice)*
3. Individual differences are huge
 - *20% of grade 2 performs above the mean level of grade 3, 7% above mean of grade 4*
4. ICT allows new developments
 - *iPads, laptops, fast internet*



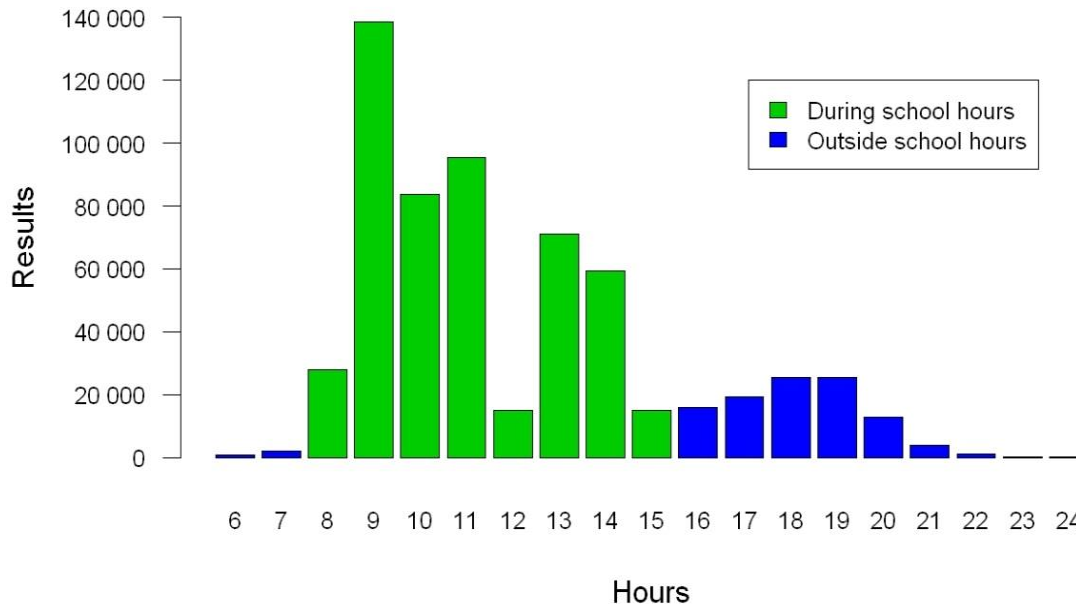
Web-based adaptive practice and monitoring systems

- Idea: Digital notebooks for daily work in classroom
- Choice practice items automatically adapted to child, *differentiation*
- Combining (playful) practicing and pupil monitoring
 - Less tests in classrooms
 - High frequency monitoring
- No checking, automatic progress reports
- Web-based (cloud)
- New type of adaptive testing (psychometrics)



User statistics

- Rekenrein.nl: 95.000 active users
- Over 230 million responses in 4 years (now > 750,000 per day)
- **Game, Train, Track & Teach**
- English version: www.mathsgarden.com



DEVELOPMENT OF VALID REPORTING IN A STUDENT MONITORING SYSTEM



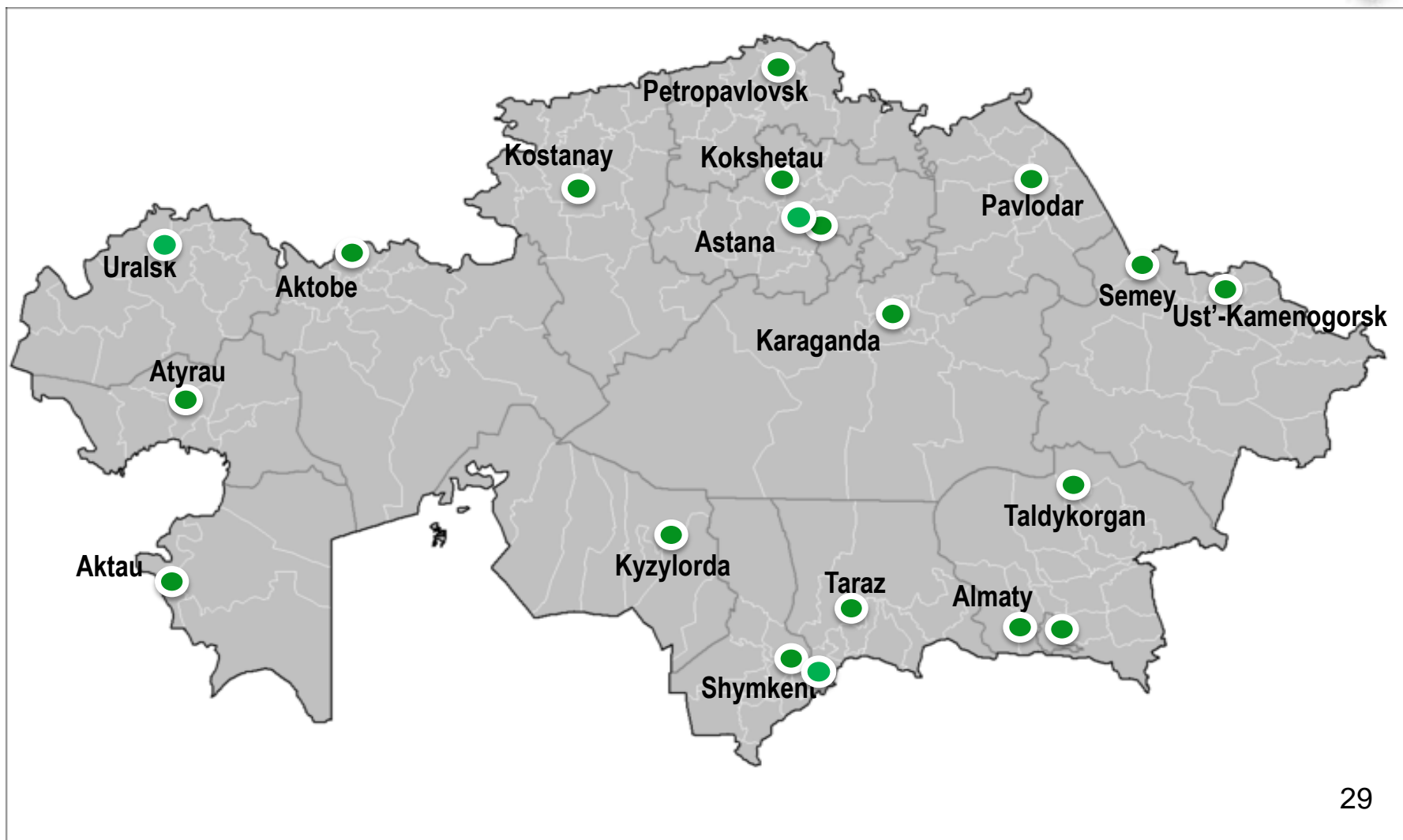
Kansas-2015



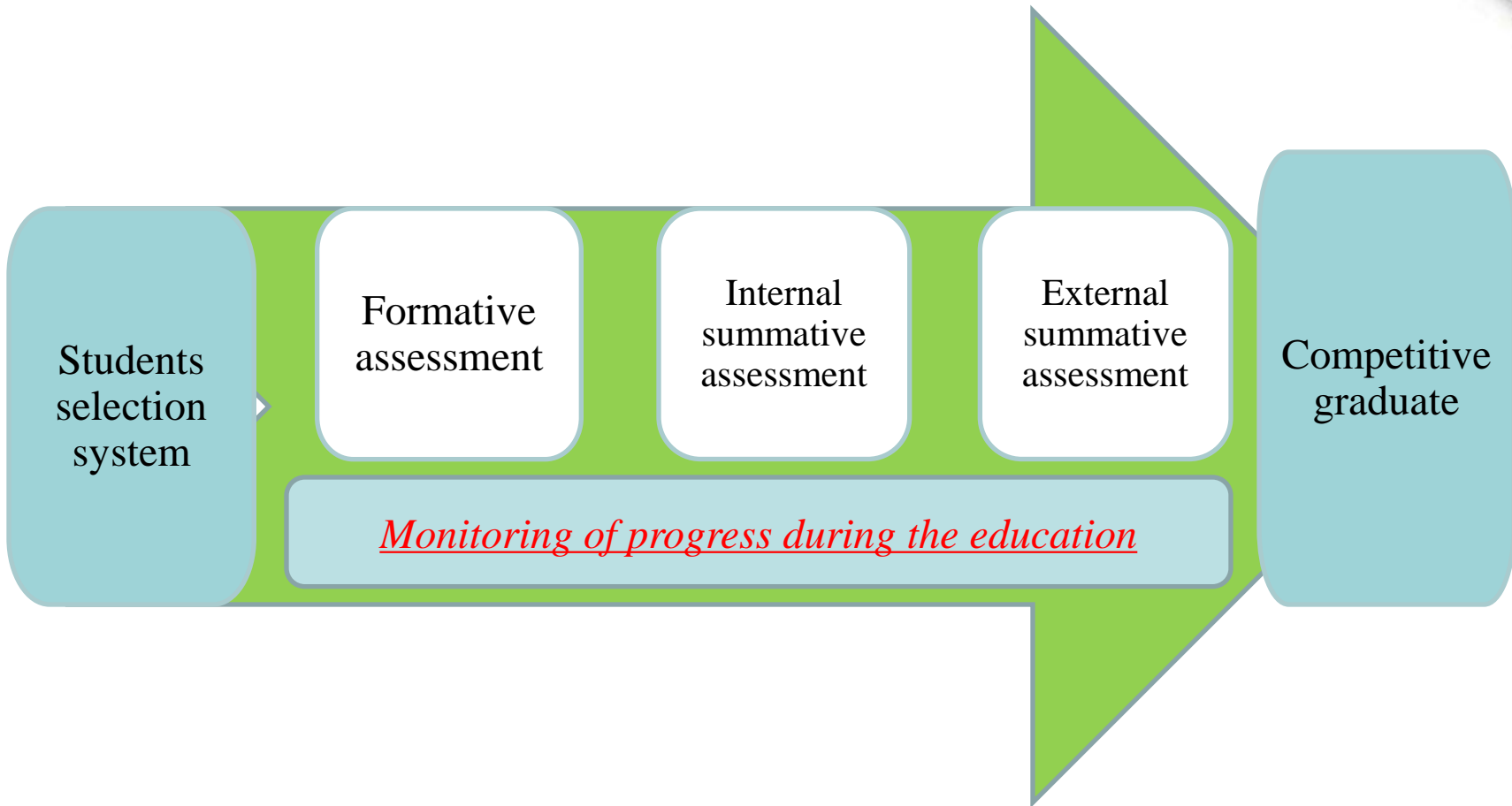
- 2008: a project of creation the Intellectual schools has been launched

- 2011: the Law of the Republic of Kazakhstan On the status of **Nazarbayev University, Nazarbayev Intellectual Schools, Nazarbayev Fund**" was adopted, that implied rights:
 - ✓ to approve own educational curricula
 - ✓ to establish requirements for entrance exams
 - ✓ to develop ongoing monitoring of progress
 - ✓ interim and final certification
 - ✓ and more

NETWORK OF NIS - 20 SCHOOLS



Assessment system



Individual support of each student from admission to the NIS up to entrance to the university

NIS students monitoring system



Purpose :

- support the learning process

Task:

- to get diagnostic information to support the learning process in accordance with students needs



Stages of developing the monitoring system

- Defined a project group:
 - NIS teachers as item developers
 - Project and subject coordinators



- Conducted several trainings on test development

Stages of developing the monitoring system

Item Construction (NIS teachers), screening (Cito subject experts), reviewing (NIS teachers plus Cito experts) and piloting

- Test administration paper/computer; Pilot 2015 fully digital with Questify
- Item properties: difficulty level, assessment criteria,
- Statistical analysis
- After piloting standard setting
- NIS teachers and Cito subject experts identify 4 achievement levels in accordance with expected outcomes of the curriculum.



Achievements levels

Require extra help from teacher

“Beginner”

It is necessary to pay a lot of attention and support, necessary to develop an individual study plan in school and at home, need an intensive involvement of the parents



“Elementary”

It is necessary to pay attention, to develop an individual study plan in school .



Does not require extra help from teacher

“Good level”

Mastered the curriculum in a sufficient level. Consistent with the expected outcomes of the curriculum .



“High level”

Perfectly mastered the curriculum, During the lessons requires an extra challenge Could be considered as a candidate for math competitions



Developing reporting Categories



DEVELOPMENT OF REPORTING

Reporting to all stakeholders:

✓ **Students and parents:**

- 1 detailed records on performance on each item per domain
- 2 individual progress report on ability scale per domain



✓ **Teachers and subject sections in school:**

Performance of student in combined groups (grade level, school level etc.)

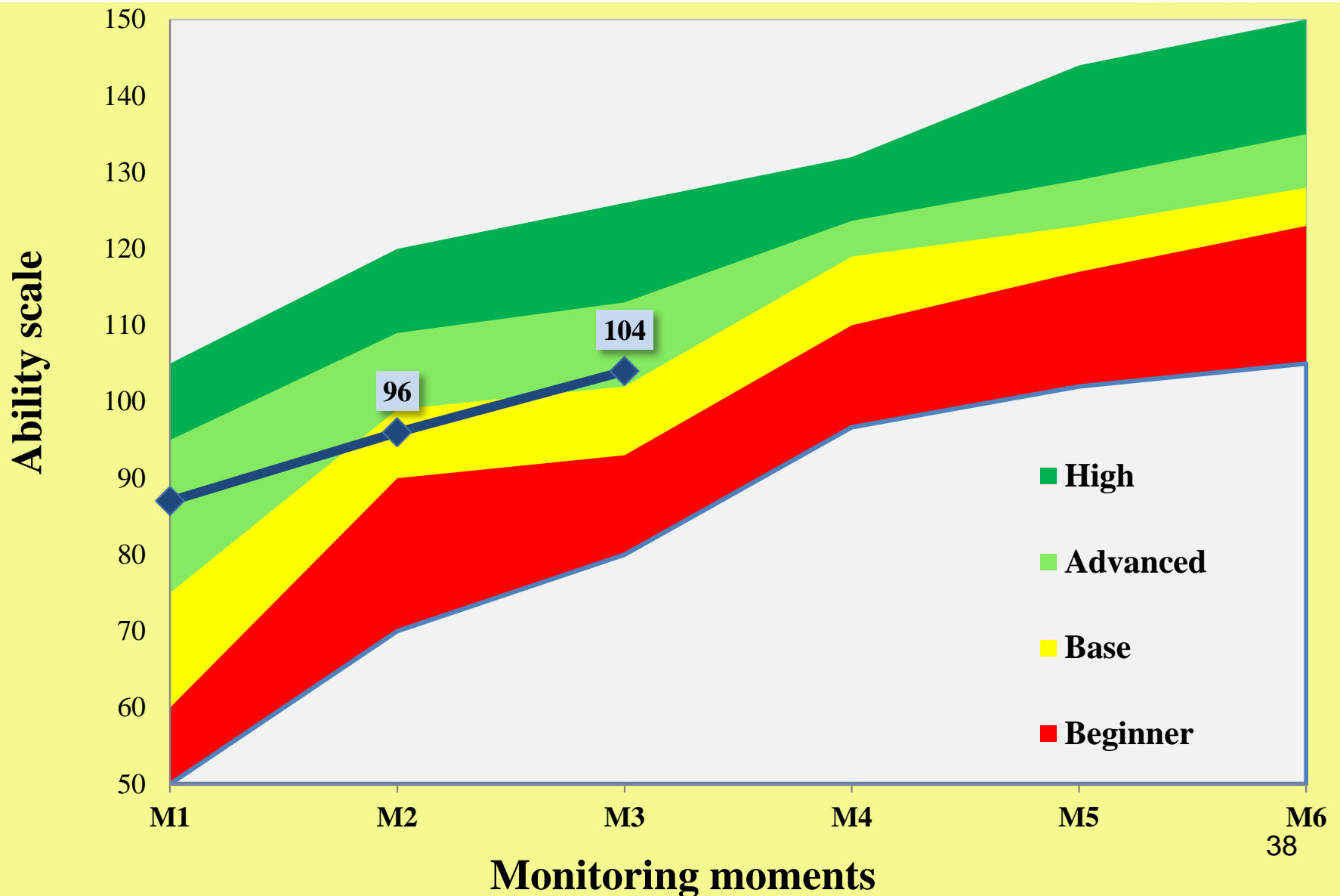
✓ **School administration and policy makers:**

An analytical report on monitoring results

Individual student report

 Педагогикалық өлшеулер орталығы Назарбаев Зияткерлік мектептері		Педагогикалық өлшеулер орталығы Cito педагогикалық өлшеулер институты, Нидерланди		 now you know	
Оқушы:	Абрахманов	Даурен			
Сәйкестендіргіш	001213550159				
Мониторинг кезеңі	1 (қыркүйек 2013)				
Мектеп	ФМБ Астана қ.				
Сынып	7С				
Сыныпта тапсырған оқушылар саны	23				
Параллельде тапсырғандар саны	184				
Зияткерлік мектептердегі оқушылар саны	1061				
	Бөлімдер	Жетістік деңгейі	Баллы *		
	Сандар	Ж	102.3		
	Алгебра	Ж	115.2		
	Геометрия	Ж	102.6		
	Статистика	Ж	107.1		
	Мат. модельдеу	Э	101.3		
Бөлім	Тапсырмалардың жалпы саны	Қарастырылмаған тапсырмалардың жалпы саны	Зияткерлік мектептері арасындағы позициясы*	Параллельдегі позициясы	Сыныптағы позициясы
Сандар	30	0	698	144	15
Алгебра	30	0	154	47	8
Геометрия	30	0	383	102	11
Статистика	30	0	555	120	10
Мат. модельдеу	30	0	569	142	15
Жалпы	150	0			
Шартты белгілер					
Жетістік деңгейі	Бөлім бойынша интервалдар*				
	Сандар	Алгебра	Геометрия	Статистика	Матем. Модельдеу
Бастауыш	50,0-94,8	50,0-94,1	50,0-95,3	50,0-91,3	50,0-94,0
Элементарлық	94,9-100,4	94,2-98,6	95,4-99,6	91,4-101,9	94,1-103,7
Жақсы	100,5-107,4	98,7-106,1	99,7-107,7	102-119,1	103,8-110,6
Жоғары	107,5-150	106,2-150	107,7-150	119,2-150	110,6-150
* Бірдей ұпайлары бар барлық оқушылар бірдей позицияда орналасқан					
** Интервалдар қабілеттілік шкаласы бойынша көрсетілген					
<i>Толығырақ қосымшалардан қараңыз</i>					
Астана -2013					

Reporting: student progress under development



Plans for further development

1

- Developing Monitoring system for other grades

2

- Further development of reporting

3

- Computerized testing

4

- Validity research of the system

5

- Introduction of Item banking system

Ďakujem za pozornosť



now you know