Developing mathematical thinking with Scratch Rubric for mathematical processes assessment

Table 1: Modeling

Criteria	Performance levels			
Cinteria	A	В	С	D
Modeling	Student prop-	Student prop-	Student prop-	Student has
	erly solves	erly solves 3 out	erly solves solve	difficulties in
	all problems	of 4 problems	2 out of 4 prob-	solving prob-
	related to mod-	related to mod-	lems problems	lems related to
	eling process, in	eling process, in	related to mod-	modeling pro-
	which detection	which detection	eling process, in	cess, in which
	of variables and	of variables and	which detection	detection of
	relationships	relationships	of variables and	variables and
	between them	between them	relationships	relationships
	that establish	that establish	between them	between them
	a mathemat-	a mathemat-	that establish	that establish
	ical model is	ical model is	a mathemat-	a mathemat-
	required, as well	required, as well	ical model is	ical model is
	as detection of	as detection of	required, as well	
	patterns that	patterns that	as detection of	as detection of
	students can	students can	patterns that	patterns that
	find in daily,	find in daily,	students can	students can
	scientific and	scientific and	find in daily,	find in daily,
	mathematical	mathematical	scientific and	scientific and
	situations, to	situations, to	mathematical	mathematical
	be mentally	be mentally	situations, to	situations, to
	reconstructed.	reconstructed.	be mentally	be mentally
			reconstructed.	reconstructed.

Table 2: Reasoning

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Criteria	Performance levels			
Cinteria	A	В	С	D
Reasoning	Student prop-	Student prop-	Student prop-	Student has
	erly uses the	erly uses the	erly uses the	difficulties in
	reasoning pro-	reasoning pro-	reasoning pro-	solving prob-
	cess to solve 3	cess to solve all	cess to solve 2	lems by using
	out of 4 prob-	the problems	oout of 4 prob-	reasoning pro-
	lems she is faced	she is faced	lems she is faced	cess where
	with, perceiving	with, perceiving	with, perceiving	she needs to
	regularities and	regularities and	regularities and	perceive reg-
	relationships,	relationships,	relationships,	ularities and
	making pre-	making pre-	making pre-	relationships,
	dictions and	dictions and	dictions and	make pre-
	conjecture or	conjecture or	conjecture or	dictions and
	justifying ar-	justifying ar-	justifying ar-	conjecture or
	guments and	guments and	guments and	justify argu-
	reasons.	reasons.	reasons.	ments and
				reasons.

Table 3: Problem solving

Table 9. 1 Toblem Solving				
Criteria	Performance levels			
	A	В	С	D
Problem	Student easily	Student solves	Student solves	Student has
problem	solves problems	3 out of 4	2 out of 4	difficulties in
solving	in which deploy-	problems in	problems in	solving prob-
	ing strategies	which deploying	which deploying	lems in which
	to find results,	strategies to	strategies to	deploying
	verifying them	find results,	find results,	strategies to
	and interpret-	verifying them	verifying them	find results,
	ing the given	and interpret-	and interpret-	verifying them
	statements is	ing the given	ing the given	and interpret-
	required.	statements is	statements is	ing the given
		required.	required.	statements is
				required.

Table 4: Exercising

	Tau	de 4. Exercising		
Criteria	Performance levels			
	A	В	С	D
Exercising	Student eas-	Student exe-	Student ex-	Student has
	ily executes	cutes algorith-	ecutes some	difficulties
	algorithmic	mic procedures,	algorithmic pro-	in executing
	procedures,	explaining the	cedures, but she	algorithmic pro-
	explaining the	concepts she	has difficulties	cedures, as well
	concepts she	uses and recog-	in explaining	as in explaining
	uses and recog-	nizing situations	the concepts	the concepts
	nizing situations	when she can	she uses and	she uses and
	when she can	apply a specific	the reasons to	the reasons to
	apply a specific	mathematical	apply a specific	apply a specific
	mathematical	technique or	mathematical	mathematical
	technique or	operation.	technique or	technique or
	operation.		operation.	operation.