ASSESSMENT GUIDE

SCIENCE PRACTICAL WORK ASSESSMENT (PEKA)

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CONTENTS

1.0 INTRODUCTION

The UPSR Science Practical Work Assessment (UPSR PEKA) is a school based assessment that is implemented at school level as part of teaching and learning process. UPSR PEKA Assessment Guide contains information on the objectives, characteristics and organization of UPSR PEKA. It also outlines the procedures to assess the pupils' practical work as guidelines to teachers as assessors and users of PEKA to carry out the assessment in a coordinated manner.

2.0 OBJECTIVES OF UPSR PEKA

The objectives in conducting UPSR PEKA is to enable the pupils to :

* Master the Scientific Skills
  - Science Process Skills
  - Science Manipulative Skills
* Strengthen the knowledge and understanding on the theories and concepts in Science
* Inculcate the Scientific Attitudes and Noble Values

3.0 THE CHARACTERISTICS OF UPSR PEKA

3.1 Compatibility with the Curriculum Specification

The assessment is designed such that it is compatible with the knowledge, scientific skills, scientific attitudes and noble values to be developed in the teaching and learning process as in the Science Curriculum Specification.

3.2 Pupil-centered

All activities should be carried out by the pupils in a condusive environment and guided by the teacher's teaching plan. The pupils' work should be assessed in accordance to their abilities and readiness.

3.3 Feasible and Systematic

The format of assessment is designed to be practical and manageable. The assessment procedure should be systematic to enable teachers to administer the assessment efficiently.

3.4 Open and Transparent

The assessment should give the pupils the opportunity to be informed on the following aspects :

- The construct to be assessed
- How the construct will be assessed
- When the construct will be assessed
- Where the construct will be assessed

3.5 Variety of Instruments

Pupils are able to use variety of instruments such as folio, project, scrap book, check-list and model to produce evidence that reflects individual's ability and their level of performance.

3.6 Continuous and Formative Assessment

The assessment is to be carried out from Year 3 until Year 6. Throughout the assessment period the pupils are encouraged to acquire knowledge and experience to enable them the opportunity to improve their work and the score obtained.

3.7 Valid and Reliable

The validity of the assessment is determined by the scores that portray relevant information on the constructs assessed. It is ascertained by ensuring the constructs assessed are within the curriculum specification.

The reliability of the assessment refers to the consistency and accuracy of the scores obtained through the process of moderation and monitoring.

3.8 Positive Reports

The scores reported should show that an acquisition of skills that stimulates the pupils to improve on their performance and achievement to a better level of mastering skills, is achieved.

3.9 Continuous Monitoring

The process of generating UPSR PEKA has to be monitored and supervised systematically from time to time to ensure it is carried out in accordance to its objectives and procedures.

4.0 THE ORGANIZATION OF UPSR PEKA

4.1 Planning

The assessment should be planned accordingly which includes aspects such as :

- the pupils to be assessed
- the time / duration to conduct the assessment
- the frequency of the assessment
- the personnel involved
- the type of instrument
- the scoring
- the grading
- the reporting

4.2 Administration

All information regarding the assessment are collected and assessed by teachers responsible in the teaching and learning process of the subject. The teachers are required to manage the evidence produced by the pupils.

4.3 Scoring

Scores are awarded based on the scoring scheme.

Total score for Science Process Skills (SPS) is 30 marks and Science Manipulative Skills (SMS) is 20 marks.

4.4 Reporting

The scores of the pupil are summarized according to the principles and the grading procedures to obtain the pupils' level of mastery.

4.5 Moderation

A mechanism exercised to ensure the pupils are assessed on the similar construct and given the relevant scores. Moderation is an essential procedure to standardize and monitor school based assessments to maintain the validity and reliability of the scores given by the teacher.

5.0 METHOD FOR ASSESSMENT

5.1 UPSR PEKA is carried out as part of teaching and learning process.

5.2 Teachers can assess either one construct/skill or several constructs/skills to a small group of pupils or the whole class.

5.3 Scientific Attitudes and Noble Values should be assessed simultaneously with other skills.

5.4 Teachers assess, give and record the score of the evidence presented by the pupils. All the information regarding the evidence are accessible to the pupils.

5.5 Pupils must submit a complete evidence.

5.6 Pupils who have not mastered any assessed constructs are able to repeat it in another assignment.

5.7 Teachers must plan enough assignments to ensure that all the constructs have been assessed.

5.8 Pupils should be given adequate chances to master the required skills before the assessment is made.

5.9 The assessment should be carried out **at least two times** in each year, from Year 3 to Year 6.
The highest score for each construct could be taken from either year.

6.0 THE FRAMEWORK OF UPSR PEKA

6.1 Learning Area

The learning area comprises of two main elements.

Element 1 : Science Process Skills (SPS)

Element 2 : Science Manipulative Skills (SMS)

Element 1 and Element 2 contain a list of criteria of the skills as performance indicator which are expected to be mastered by the pupils. The criteria are extracted and translated from the Modul Kemahiran Proses Sains - Pusat Perkembangan Kurikulum, 1995.

The Scientific Attitudes and Noble Values are imbedded during the assessment of science process skills and science manipulative skills and must be observed by the teacher / assessor.

The activity code is represented by the following information:

Year / Theme / Learning Objective / Learning Outcomes

(Refer Curriculum Specification)

6.2 Construct, Score and Criteria (Performance Indicator)

6.2.1 Element 1 : Science Process Skills (SPS)

<table>
<tr><th>Construct</th><th>Score</th><th>Criteria</th><th>Remark</th></tr>
<tr><td rowspan="6">SPS 1
Observing</td><td rowspan="3">4</td><td>C1 – State the properties of objects and situations correctly using any of the five senses</td><td rowspan="6">Suggested activity

(i) Field study
(ii) Experiment
(iii) Project

Examples :
3 / 1 / 1.1 / 4
3 / 1 / 1.2 / 1
3 / 1 / 2.1 / 4
3 / 2 / 6.1 / 1
4 / 1 / 3.2 / 1 & 2
4 / 1 / 3.4 / 1 & 2
4 / 1 / 3.5 / 2 & 5
5 / 1 / 1.1 / 3
6 / 1 / 1.1 / 1 - 6
6 / 1 / 1.2 / 1
(Refer Curriculum Specification)</td></tr>
<tr><td>C2 – State the properties of objects and situations correctly using appropriate tools to assist senses</td></tr>
<tr><td>C3 – State the properties of objects and situations based on the sequences occured</td></tr>
<tr><td>3</td><td>C1 and C2</td></tr>
<tr><td>2</td><td>C1 or C2</td></tr>
<tr><td>1</td><td>C1 or C2 (with guidance)</td></tr>
</table>

<table>
<tr><th>Construct</th><th>Score</th><th>Criteria</th><th>Remark</th></tr>
<tr><td rowspan="6">SPS 2
Classifying</td><td rowspan="4">4</td><td>C1 – Grouping objects or events in order into categories based on one common property or criteria</td><td rowspan="6">Suggested activity

(i) Field study
(ii) Experiment
(iii) Project

Examples :
3 / 1 / 1.1 / 1
3 / 1 / 1.3 / 1
3 / 1 / 2.3 / 1
3 / 2 / 1.3/ 1
3 / 2 / 4.1 / 1
4 / 1 / 2.3 / 9
4 / 3 / 1.1 / 1 & 11
5 / 1 / 2.2 / 1
6 / 1 / 3.1 / 2
5 / 3 / 1.1 / 1
6 / 3 / 1.2 / 2
6 / 3 / 2 / 2.1 / 1
(Refer Curriculum Specification)</td></tr>
<tr><td>C2 – State the differences and similarities of the physical properties or criteria</td></tr>
<tr><td>C3 – State the common properties or criteria used in each step of classification</td></tr>
<tr><td>C4 – Grouping objects or events in order into categories based on properties or criteria until the final step or the higher level</td></tr>
<tr><td>3</td><td>C1, C2 and C3</td></tr>
<tr><td>2</td><td>C1 and C2</td></tr>
<tr><td>1</td><td>C1 with guidance</td></tr>
<tr><td rowspan="6">SPS 3
Measuring and
Using Numbers</td><td rowspan="4">4</td><td>C1 – Use the correct apparatus to measure quantities e.g. length, volume, mass, time, temperature and speed</td><td rowspan="6">Suggested activity

(i) Field study
(ii) Experiment
(iii) Project

Examples :
4 / 2 / 1.1 / 3 - 4
4 / 2 / 1.2 / 3
4 / 2 / 1.4 / 4 & 5
4 / 2 / 1.5 / 3 & 4
4 / 2 / 1.6 / 4 & 5
5 / 2 / 4.1 / 3
6 / 2 / 2.1 / 1 & 2
(Refer Curriculum Specification)</td></tr>
<tr><td>C2 – Record reading using numbers and correct standard unit (SI)</td></tr>
<tr><td>C3 – Record reading accurately</td></tr>
<tr><td>C4 – State the increase and decrease in a reading</td></tr>
<tr><td>3</td><td>C1, C2 and C3</td></tr>
<tr><td>2</td><td>C1 and C2</td></tr>
<tr><td>1</td><td>C1 and C2 with guidance</td></tr>
</table>

Construct	Score	Criteria	Remark
SPS 4 Communicating	**4**	C1 – Record data or information from an investigation	Suggested activity (i) Field study (ii) Experiment (iii) Project *Examples* : 5 / 2 / 4.1 / 5 6 / 1 / 1.2 / 2 5 / 3 / 1.3 / 1 4 / 1 / 1.2 / 3 4 / 3 / 1.6 / 2 6 / 4 / 1.1 / 3 (Refer Curriculum Specification)
		C2 – Present data or information using appropriate drawing, table or graph	
		C3 – Explain ideas (oral or written)	
		C4 – Write experimental report systematically (With or without guidance)	
	3	C1, C2 and C3	
	2	C1 and C2	
	1	C1 with guidance	
SPS 5 Using Space-Time Relationship	**4**	C1 – Arrange occurance of phenomenon or events chronologically	Suggested activity (i) Field study (ii) Experiment (iii) Project *Examples* : 5 / 4 / 2.1 / 2 6 / 4 / 1.1 / 3 6 / 4 / 1.2 / 2 5 / 2 / 3.1 / 4 (Refer Curriculum Specification)
		C2 – State the relationship between the distance travelled and the time taken	
		C3 – State the quantity of changes based on the rate of changes	
		C4 – Explain changes in location, size, shape and direction, with time	
	3	C1, C2 and C3	
	2	C1 and C2	
	1	C1 and C2 with guidance	

Construct	Score	Criteria	Remark
SPS 6 Defining Operationally	**4**	C1 – State concepts by describing what should be observed	Suggested activity (i) Field study (ii) Experiment (iii) Project *Examples* : 6 / 2 / 1.3 / 7 5 / 3 / 2.1 / 1 6 / 1 / 1.2 / 2 6 / 3 / 1.2 / 2 6 / 5 / 1.2 / 2 (Refer Curriculum Specification)
		C2 – State concepts by describing what should be done	
		C3 – State variables by describing what should be observed	
		C4 – State variables by describing what should be done	
	3	C1 and C2 or C3 and C4	
	2	C1 and C2	
	1	C1 or C2 with guidance	
SPS 7 Experimenting	**6**	C1 – State the hypothesis (relationship between what to change and what to measure)	*Examples* : 5 / 3 / 2.1 / 3 5 / 2 / 2.2 / 6 5 / 2 / 3.1 / 4 5 / 2 / 4.1 / 1 6 / 2 / 1.3 / 8 6 / 2 / 2.1 / 1 (Refer Curriculum Specification)
		C2 – State the variables i.e. what to change, what to measure and what to keep constant in an experiment	
		C3 – Identify the apparatus in an experiment	
		C4 – State the steps in an experiment (oral or written)	
		C5 – Carry out an experiment to test the hypothesis by controlling variables in a coordinated manner	
		C6 – Present the result in the form of drawing, table, graph or other means	
	5	C1, C2, C3, C4 and C5	
	4	C1, C2, C3 and C4	
	3	C1, C2 and C3	
	2	Any two criteria (C1 , C2 , C3)	
	1	C1 or C2 or C3 with guidance	

6.2.2 Element 2 : Science Manipulative Skills (SMS)

Construct	Score	Criteria	Remark
SMS 1 **Use and handle science apparatus and substances**	**4**	C1 – Use at least 5 apparatus correctly and carefully C2 – Handle apparatus and substances correctly and carefully C3 – Set up the apparatus or prepare the substances in an orderly manner C4 – Carry out the experiment following the correct procedures	*Example* Use ruler, hand lens, measuring cylinder, microscope, thermometer, bunsen burner, stop watch, test tube, stethoscope and retort stand Note SPS and SMS can be carried out together
	3	C1, C2 and C3	
	2	C1 and C2	
	1	C1 with guidance	
SMS 2 **Handle living and non-living specimens**	**4**	C1 – Handle living specimens correctly and carefully C2 – Handle non-living specimens correctly and carefully C3 – Caring for living specimens C4 – Use non-living specimens without waste	*Example* Living specimen (i) Young plants (ii) Insects Non-living specimen (i) Stick (ii) Water (iii) Stone (iv) Soil
	3	C1, C2 and either C3 or C4	
	2	C1 and C2	
	1	C1 or C2 with guidance	

Construct	Score	Criteria	Remark
SMS 3 Draw specimen, apparatus and substances	**4**	C1 – Draw neatly	
		C2 – Label drawings correctly	
		C3 – Draw what is observed	
		C4 – Draw using correct scales	
	3	C1, C2 and C3	
	2	C1 and C2	
	1	C1 with guidance	
SMS 4 Clean apparatus	**4**	C1 – Clean apparatus using the correct method	Assessed after carrying out an experiment (fair test). Holistic and continuous assessment.
		C2 – Dispose waste using the correct method	
		C3 – Clean apparatus **(frequently)**	
	3	C1 and C2 Clean apparatus **(sometimes)**	
	2	C1 and C2 Clean apparatus **(rarely)**	
	1	C1 and C2 with guidance	

Construct	Score	Criteria	Remark
SMS 5 **Store apparatus and substances**	**4**	C1 – Store apparatus and substances correctly and safely	Assessed after carrying out an experiment (fair test). Holistic and continuous assessment.
		C2 – Store apparatus and substances correctly and safely**, (frequently)**	
	3	C1 and Store apparatus and substances **(sometimes)**	
	2	C1 and Store apparatus and substances **(rarely)**	
	1	C1 with guidance	

7.0 SCORING PROCEDURE

The marks / scores obtained from each construct (skills / values) assessed is recorded in the Individual Score Form (ISF).

7.1 Individual Score Form (ISF)

Refer Appendix 1 : Year 3
Appendix 2 : Year 4
Appendix 3 : Year 5
Appendix 4 : Year 6

(i) Tick the highest score in the relevant cell with reference to the scoring scheme.

(ii) Write the highest score obtained for each construct in the respective cell.

7.2 Final Individual Score Form (ISF)

Refer Appendix A.
Write the highest score obtained for each construct.
The highest score for each construct could be taken from either year.

7.3 Procedures in Managing ISF

(i) ISF is used to record the scores of each pupil during the assessment based on the construct assessed.

(ii) ISF should be used by teachers / assessors and moderators.

(iii) ISF must be completed in two copies:
(a) the original copy is kept by the teacher / assessor
(b) the second copy is kept in the pupils PEKA record book

(iv) ISF must be certified by the school headmaster at the end of the assessment period.

(v) If a pupil transfers to another school, an updated copy of the ISF should be enclosed together with the personal file to be submitted to the new school.

8.0 REPORTING PROCEDURE

8.1 School Report

The school final report should be in the form of a certificate issued by the school and authorised by the school headmaster. The certificate shows the highest score obtained for each construct.

8.2 Master Score Form (MSF)

At the end of the assessment period (Year 6), the highest score for every construct must be transferred to the MSF. Teachers must sum up the total score for every construct to obtain the total score for PEKA.

The completed MSF must be submitted to Lembaga Peperiksaan Malaysia according to the scheduled date.

Refer **Master Score Form** : Appendix B.

Appendix 1

SCIENCE PRACTICAL WORK ASSESSMENT (PEKA) - UPSR
INDIVIDUAL SCORE FORM
YEAR 3

SCHOOL : ……

Name …… **Class** ……..

Date	Activity Code	SPS 1				SPS 2			
		1	2	3	4	1	2	3	4
Highest Score									

Remarks

Date	Activity Code	SMS 1				SMS 2				SMS 3				SMS 4				SMS 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Highest Score																					

Evaluated by **Authorised by**

Appendix 2

SCIENCE PRACTICAL WORK ASSESSMENT (PEKA) - UPSR
INDIVIDUAL SCORE FORM
YEAR 4

SCHOOL : ……

Name …… **Class** ……..

Date	Activity Code	SPS 1				SPS 2				SPS 3				SPS 4			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Highest Score																	

Remarks

Date	Activity Code	SMS 1				SMS 2				SMS 3				SMS 4				SMS 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Highest Score																					

Evaluated by **Authorised by**

Appendix 3

SCIENCE PRACTICAL WORK ASSESSMENT (PEKA) - UPSR
INDIVIDUAL SCORE FORM
YEAR 5

SCHOOL : ……

Name …… **Class** ……..

Date	Activity Code	SPS 1				SPS 2				SPS 3				SPS 4				SPS 5				SPS 6				SPS 7					
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	5	6
Highest Score																															

Date	Activity Code	SMS 1				SMS 2				SMS 3				SMS 4				SMS 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Highest Score																					

Evaluated by **Authorised by**

Appendix 4

SCIENCE PRACTICAL WORK ASSESSMENT (PEKA) - UPSR
INDIVIDUAL SCORE FORM
YEAR 6

SCHOOL : ……

Name …… **Class** ……..

Date	Activity Code	SPS 1				SPS 2				SPS 3				SPS 4				SPS 5				SPS 6				SPS 7					
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	5	6
Highest Score																															

Date	Activity Code	SMS 1				SMS 2				SMS 3				SMS 4				SMS 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Highest Score																					

Evaluated by **Authorised by**

Appendix A

SCIENCE PRACTICAL WORK ASSESSMENT (PEKA) - UPSR

FINAL INDIVIDUAL SCORE FORM

SCHOOL : ……

Name …… **Class** ……..

	SPS 1	SPS 2	SPS 3	SPS 4	SPS 5	SPS 6	SPS 7	Total SPS
Maximum Score	**4**	**4**	**4**	**4**	**4**	**4**	**6**	**30**
Highest Score								

	SMS 1	SMS 2	SMS 3	SMS 4	SMS 5	Total SMS
Maximum Score	**4**	**4**	**4**	**4**	**4**	**20**
Highest Score						

Total Score	**50**

Evaluated by **Authorised by**

Appendix B

SCIENCE PRACTICAL WORK ASSESSMENT (PEKA) - UPSR
MASTER SCORE FORM (MSF)

SEKOLAH		TAHUN	
NEGERI		KOD PUSAT	

BIL.	ANGKA GILIRAN / NO. SURAT BERANAK	NAMA	SPS								SMS						JUMLAH SKOR PEKA
			1	2	3	4	5	6	7	JUMLAH	1	2	3	4	5	JUMLAH	

Signature of Assessor

Signature of Headmaster