MALAYSIAN NATURE EDUCATION IN PRESCHOOL (MYNEPS) INTERVENTION: PRE AND POST ASSESSMENT

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Abstract

Malaysian Nature Education in Preschool (MyNEPs) is an initiative to incorporate nature education in the preschool syllabus. It involves learning and hands-on practice in a natural environment setting on five nature elements (climate, flora, fauna, insects, and microbes). This research aims to assess the efficacy of the MyNEPs module towards preschool children through pre-, intervention, and post-assessment. This research adopted an experimental

research design using quantitative approaches. A total of 29 preschool children from Bangi, Selangor were involved in this study. Data collected were analyzed using descriptive and inferential statistics involving normality tests and paired sample t-test. The data normality was measured using the Shapiro-Wilk test, and the result indicated that the data is normally distributed where p=0.072 > 0.05. The overall t-test result shows significant differences (p=0.006) between pre- and post-achievement, with the total mean of post-test was higher with 35.90 than pre-test achievement with 33.59. This result indicated that this module significantly contributes to children's performance on nature prior to the intervention program. As a result, this study shows that the nature education program proposed has improved preschool children's knowledge of the natural environment. Nature education is essential to enhance creativity, problem-solving, and cognitive abilities, thus improving academic performance and setting a strong foundation for science and technology. Therefore, it is suggested that the MyNEPs module should be applied to all preschools premises in Malaysia.

Keywords: Assessment, intervention, MyNEPs, Nature education, preschools

1.0 INTRODUCTION

Recently, the Malaysian government has introduced and emphasized STEM (Science, Technology, Engineering, and Mathematics) education (Mazlini et al. 2016). STEM became a critical approach to be integrated into the school system in this country for long-term academic success. It has been assimilated as one of the education fields which is more relevant to be implemented in preschools as it emphasized practical and hands-on experience (Sneideman 2013).

Since childhood, learning about nature should be instilled, especially at the preschool level (Stanislawa & Anna 2017). Nature education has been integrated into the preschool curriculum as one component taught in each preschool in the United Kingdom (UK), Australia, and Canada (Fadzilah 1999). The Malaysian education system should also benefit from this program to enhance the students' ability to integrate knowledge across disciplines and

encouraging them to think in a more connected and holistic way, through interaction with the natural environment and spending time in nature (Martensson et al. 2009). Besides that, learning about nature plays an essential role in developing the children's domains, such as cognitive development, and improving their academic performance (Wilson 2008; Maynard & Waters 2007). Thus, experimental learning in a natural environment since early childhood could contribute a strong foundation of math and science lessons later, when the children enter into primary, secondary, and tertiary education (Valarie et al. 2011 & Noor Mirza 2015). Therefore, this intervention program must start early to produce an outstanding student in science fields and set a strong foundation for science and technology in the future.

Currently, the Malaysian education system only emphasizes indoor theoretical practice than a practical lesson (Syariza & Aliza 2016). This passive system not only blocks the children's creativity and imagination but also affects the children's development and learning process. A child's healthy development requires him to be in a stimulus-rich environment and thus offering him/her new learning opportunities. These positive experiences help the child develop positive attitudes towards school, learning, and his skills. Learning centers constitute an essential part of the educational environment in preschool education. One of the initiatives has been developed by the UKM researchers, known as Malaysian Nature Education in Preschool Program (MyNEPs), which develop a specific nature module for preschool children (Mohd-Taib et al. 2018). This module encompassed nature education which covers five components; climate, flora, fauna, insect and microbes. On the other hand, the intervention program involves engaging the children in nature through outdoor and hands-on activities of each nature components, with the aid of specific work sheet.

MyNEPs intervention applied inquiry, children-centered learning, and activities-based approach. In addition, the elements of STEM also to be integrated into the MyNEPs module through learning about nature. Before the intervention, the children will be assessed based on

a set of questions on nature. Another assessment will be given out after the intervention program. Therefore, this study aims to assess the level of preschool children's knowledge of nature by implementing the MyNEPs intervention program. The hypothesis is that the level of knowledge and perception of nature will be higher after the intervention program.

2.0 RESEARCH METHODOLOGY

This research adopted an experimental research design. A total of 29 children (9 boys and 20 girls), aged 6 years old, who received early childhood education from Taman Bimbingan Kanak-Kanak (TABIKA) around Bangi, Selangor, participated in this research. The preschools in Bangi were selected as research locations because of their status as sub-urban areas and surrounded by the natural environment. There were two instruments developed in this research, which is pre- Assessment and post-assessment worksheet. The items in the pre and post-assessment worksheet were divided into 5 topics, consist of climate (4 items), flora (5 items), fauna (3 items), insects (5 items), and microbes (2 items).

The test specification table (JSU) of the pre and post-assessment was developed based on the cognitive domain in the taxonomy bloom. The JSU focused on 3 levels in the cognitive domain: level 1 is remembering and understanding, level 2 is application and analysis, and level 3 is evaluation and creation. The percentage of level 1 is 43.48%, level 2 is 39.13%, and level 3 is 17.39%.

In the first phase, data for pre-assessment was collected. For this purpose, an activity was conducted with the children, and activity-based approaches were applied throughout the activity. During this activity, children were given a worksheet, with teacher-facilitated them to fill out the worksheet. This data will be baseline data to represent children's prior knowledge and view about nature.

In the second phase, the MyNEPs program intervention was conducted at the nature-based recreational area in UKM Bangi. The intervention activities consist of discussions, observation, and exploration of different natural elements, including climate (colors of rainbow and weather), flora, fauna, insects, and microbes. Inquiry-learning and child-centered learning approaches were applied throughout the intervention activities.

In the final phase, data for post-assessment was collected within a month after the intervention took place. The activity in this phase used the same worksheet as the pre-assessment phase. This data was known as post-intervention data to represent children's current knowledge and view about nature.

Descriptive and inferential statistics were used to analyze the data. Normality test is to ensure the data is normally distributed (Peter et al., 2014). The normality test was used to determine whether sample data has been drawn from a normally distributed population. The paired sample t-test was used to test for a statistical difference between two related sample means and provided data on two separate occasions before and after intervention (Pre and post-assessment). Both these analyses were analyzed using Statistical Package for Social Science (SPSS) software.

3.0 RESULT AND DISCUSSION

3.1 Demography

There were four Tabika selected in this research which are located in suburban areas around the Bangi district. The target group was children at 6 years of age and represented 29 samples from the four Tabika. Figure 1 shows the percentages of children who participated in this research. A total of 6 children were from Tabika Batu 6 (Bt.6) (20.69%), 7 children from Tabika Teras Jernang (Tj) (24.13%), and 8 children from (27.59%) from both Tabika Pekan Bangi

(Pb) and Tabika Kampung Bahagia (Kb). Of these numbers, 9 children were boys (31%), while another 20 children were girls (69%).

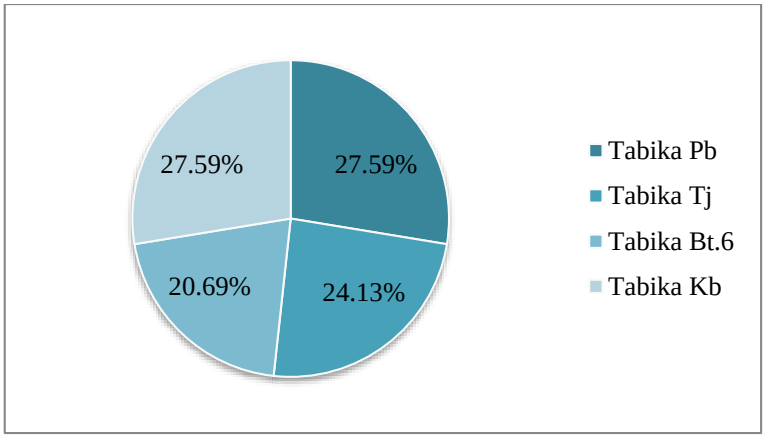

Figure 1. Percentage of Children's Participated in This Research

Table 1 below shows the achievements of each child involved for both pre-and post-assessments from the four Tabikas. Tabika Pb shows that most children have an improvement in their knowledge after an intervention program. However, only one of the children from this Tabika had decrease performance in post-assessment scores. The percentage of children's performance increase from this Tabika by 88%. This is similar to Tabika Tj and Kb, as most of the children from this Tabika show an improvement but only two children had decreased post-assessment scores. The percentage of children scores from Tabika Tj is 71%, and Tabika Kb is 75%. Tabika Bt.6 also shows improvement in their knowledge after an intervention program.

Table 1. Total of Children's Marks During Pre and Post Assessment

No.	Name	Gender	Pre	Post
1	Pb_C1	G	38	41
2	Pb_C2	B	21	26
3	Pb_C3	G	29	34
4	Pb_C4	G	40	38

5	Pb_C5	G	31	36
6	Pb_C6	G	29	37
7	Pb_C7	G	35	38
8	Pb_C8	G	39	39
9	Tj_C1	B	37	28
10	Tj_C2	B	35	39
11	Tj_C3	G	37	37
12	Tj_C4	G	36	37
13	Tj_C5	G	39	39
14	Tj_C6	G	30	36
15	Tj_C7	B	37	31
16	Bt.6_C1	G	35	35
17	Bt.6_C2	G	31	37
18	Bt.6_C3	G	37	37
19	Bt.6_C4	B	30	36
20	Bt.6_C5	B	29	33
21	Bt.6_C6	B	27	36
22	Kb_C1	G	38	35
23	Kb_C2	B	33	33
24	Kb_C3	B	35	34
25	Kb_C4	G	36	40
26	Kb_C5	G	34	38
27	Kb_C6	G	29	35
28	Kb_C7	G	33	41
29	Kb_C8	G	34	35

(Note: Gender: G=girl, B=boy)

Table 2 shows the test of normality for pre and post-assessment from MyNEPs intervention. The Shapiro-Wilk test is generally considered more appropriate for smaller samples (Tabachnick & Fidell, 2007). The total of significant value Shapiro-Wilk test in pre- and post- Assessment is p=0.072 > 0.05, indicated the normality assumption is not violated; thus, the data is normally distributed. Meanwhile, the Shapiro-Wilk in post-assessment was p=0.027 < 0.05, which means the data is not normally distributed. In other words, the normality assumption in post-assessment is violated.

Table 2. Test of Normality Pre And Post Assessment

	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Pre	.145	29	.125	.934	29	.072
Post	.155	29	.071	.918	29	.027

3.2 Pre And Post Assessment in each Tabika

Table 3 shows the mean cumulative mark for pre- and post assessment, as well as the mean difference between both assessment at each pre-school involved. In general, there were higher marks for post-assessment compared to pre-assesment at all TABIKA except Teras Jerang but with slight different. There were significant difference of pre- and post-assessment at two pre-schools, namely Pekan Bangi and Batu 6 (p<0.05), with higher marks in post-assessment both. Teras Jernang and Kampung Bahagia pre-schools did not show significant difference between pre- and post assessment.

Table 3. Mean+SE and mean difference of pre- and post-assessment for each TABIKA pre-school.

TABIKA pre-school	Assessment	Mean±SE	N	T	df	p
Pekan Bangi (PB)	Pre	32.75±2.289	8	-3.021	7	.019*
	Post	36.13±1.619				
Teras Jernang (TJ)	Pre	35.86±1.079	7	.286	6	.785
	Post	35.29±1.584				
Batu 6 (Bt.6)	Pre	31.50±1.544	6	-2.834	5	.036*
	Post	35.67±.615				
Kampung Bahagia (KB)	Pre	34.00±.926	8	-1.796	7	.115
	Post	36.38±1.034				

From eight children's from TABIKA Pekan Bangi participated in pre- and post assessment, majority children have increased their performance in post assessment. Mean achievement in pre-assessment is 32.75 compared to postassessment (36.13) with the significant value of 0.019 ($p < 0.05$) indicated that there is significant difference in children's knowledge before and after MyNEPs intervention program. Similarly, TABIKA Batu 6 pre-school also shows significant increase score of post-assessment (35.67) compared to pre-assessment (31.50), p=0.036 ($p < 0.05$). The significant value of indicated that there were significant difference in children's performance after undergoing the MyNEPs intervention program. This finding indicate the effectiveness of the MyNEPs intervention activities, among pre-school children. Both these pre-schools were located more remotely, and these children stayed in areas close to natural environment, thus could possibly engage them in nature more. Nature education is proven to enhance children knowledge about the natural environment, and stimulate question-asking regarding nature, due to the experiential learning which

ultimately develop a holistic domain in later stage of their life (Wilson 2008; Maynard & Waters 2007).

Comparatively, TABIKA Teras Jernang and Kampung Bahagia did not show significant difference between pre- and post-assessment (p>0.05). Nevertheless, Kampung Bahagia still obtained higher score in post-assessment (36.38±1.034) compared to pre-assessment (34.00±.926). Teras Jernang on the other hand showed only slight difference of score between pre- (35.86±1.079) and post-assessment (35.29±1.584). Both these pre-chools were located closer to the town, thus the children were possibly less expose to natural environment. Fantuzzo et al. (2000) raised the role of family participation in early childhood education with demographic background contributed significantly to the child learning experience. Therefore, explain the differences in learning efficiency could be contributed to the family engagement, as well their surrounding influences.

3.3 Pre And Post Assessment In All Four Preschools Involved

The overall mean achievement and significant value children's from the four TABIKA in pre and post assessment is shown in table 4. Total of mean achievement were significantly higher, p=0.006 (p<0.05in post-assessment is 35.90±0.636 compared to pre-assessment 33.59±0.809. Therefore, MyNEPs interventions program has given a positive impact to the children's performance about nature. This finding is supported by Aminah et al. (2017), Wilson (2008) and Maynard & Waters (2007), as learning through practical and hands-on can stimulate children thought, creative and gain their knowledge as well.

Table 4. The overall results mean value of pre and post assessment in four pre schools involved

Assessment	Mean±SE	N	T	df	*p*-value
Pre	33.59±0.809	29	-2.980	28	.006
Post	35.90±0.636				

Piaget's theory of learning and cognitive development, emphasis children of age 4 until 6 year's old should be engaged and experienced real aid source learning (Huitt & Hummel 2003). Teachers play a big role to expose the children to exploring the nature, through hands-on. These approach could contribute positive impact to the children performance on their learning process. In addition, exposing the children to nature potentially enhance the children's curiosity, activeness, focus and enjoy in learning process and directly gain their knowledge as well. Teachers also play an important role in delivering knowledge to the pre-school children. Lack of knowledge and experience in teaching and learning process becomes a major obstacle in the success of learning outcomes (Mohamad Allif et al. 2017).

MacQuarrie et al. (2013) indicate that nature is utilized as setting, resource and educator on its own especially towards early-childhood education. Therefore, the five nature elements embedded within MyNEPs program provide a holistic tool to be incorporated into pedagogical practice in pre-schools. Educators or the pre-school teacher could use a flexible method such as practical learning than a traditional pedagogy approached. For instance, before an intervention program, the children generally not familiar with nature pertaining to flora, fauna, and insects elements. However, after the intervention program activity, majority children have an improvement their knowledge on nature by naming of the flora, fauna and insects correctly. Incorporating the microbes element in the module on the other hand, also essential to built awareness on hygiene among the children after indulging in the outdoor activities.

4.0 CONCLUSION

This study has shown that the Malaysian Nature Education in Preschool (MyNEPs) intervention program positively impacts the children and teachers involved in this project. The finding shows that this program can be implemented to increase preschool childrens' cognitive level about nature, consisting of climate, flora, fauna, insects, and microbes. The increasing mark of preschool children has proved the success of this program during post-assessment. The program also gives an advantage to the teachers in improving their teaching method in delivering the knowledge through a children-centered learning and activities-based approach. Moreover, it shows that the program's teaching and learning approach is appropriate because it allows preschool children to explore and experience the natural environment. Thus, it is believed that the MyNEPs program can help to enhance preschool children's knowledge of the environment and nature. This approach can improve children's domains holistically through learning and exploring nature in their actual situation. Therefore, it is suggested to be implemented in all preschools premises in Malaysia.

5.0 ACKNOWLEDGMENT

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Appendices

Activities During Intervention Program

Students learned the process of planting beans

Student with the facilitators after finished an activity at climate station

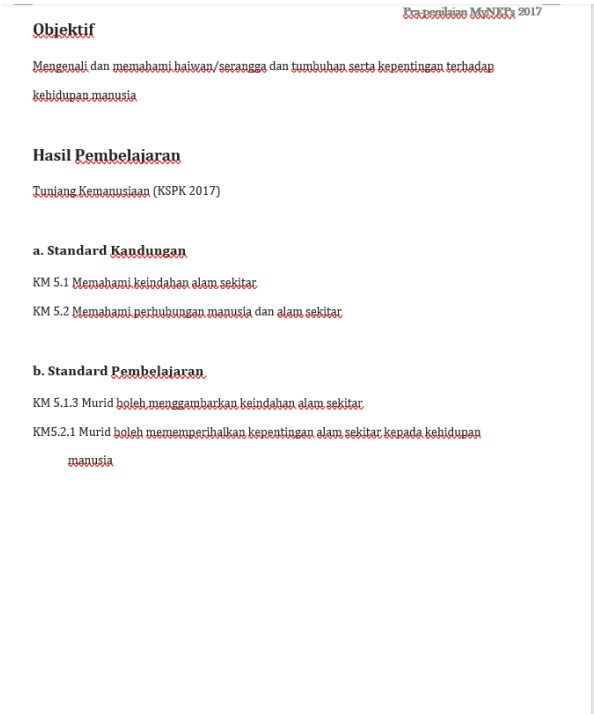
Students learned about rain occurrence process

Students answered the question based on the activity book at flora station

Planted beans made by the students

The facilitators taught the students about bacteria and virus at microbes' station

Test instrument for the assessment (fauna, insects, flora)



Pra penilaian MyNEP: 2017

Objektif

Mengenali dan memahami haiwan/serangga dan tumbuhan serta kepentingan terhadap kehidupan manusia

Hasil Pembelajaran

Tunjang Kemanusiaan (KSPK 2017)

a. Standard Kandungan

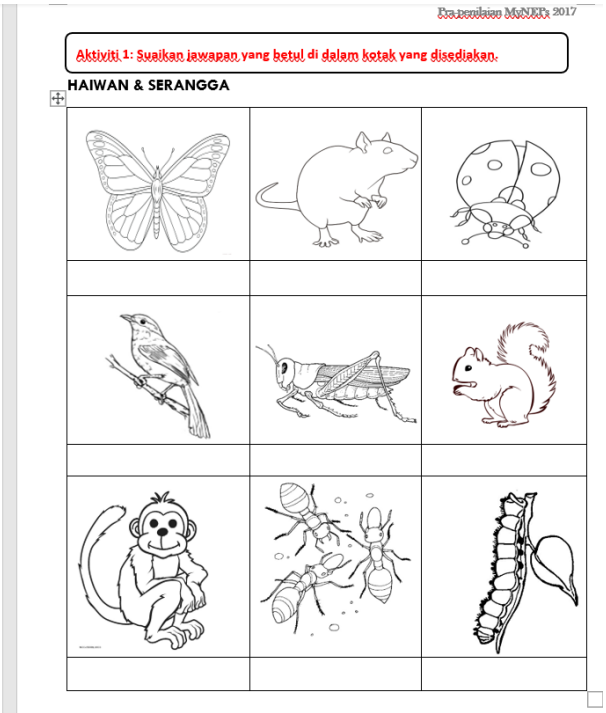
KM 5.1 Memahami keindahan alam sekitar

KM 5.2 Memahami perhubungan manusia dan alam sekitar

b. Standard Pembelajaran

KM 5.1.3 Murid boleh menggambarkan keindahan alam sekitar

KM5.2.1 Murid boleh mememperihalkan kepentingan alam sekitar kepada kehidupan manusia



Pra penilaian MyNEP: 2017

Aktiviti 1: Suaikan jawapan yang betul di dalam kotak yang disediakan.

HAIWAN & SERANGGA

Pra penilaian MyNEP: 2017

Burung

Tupai

Semut

Kumbang

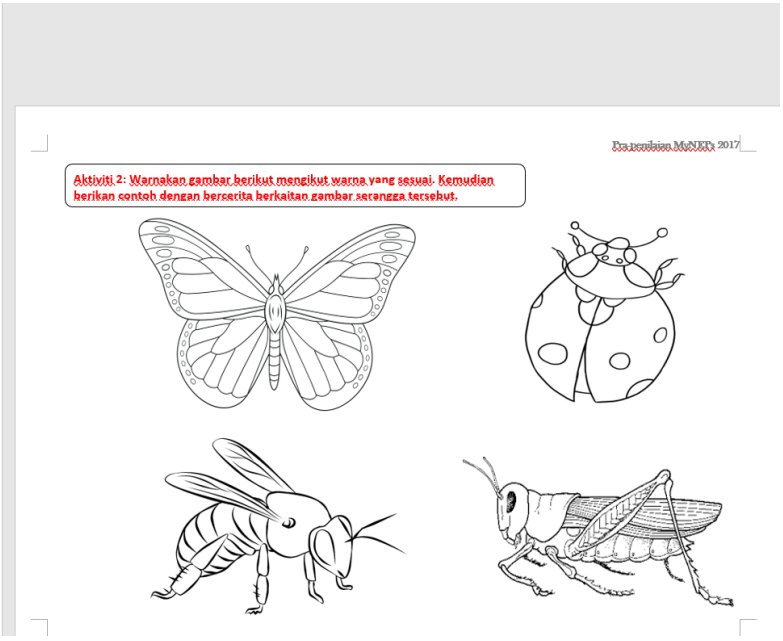
Monyet

Ulat beluncas

Tikus

Belalang

Rama-rama



Pra penilaian MyNEP: 2017

Aktiviti 2: Warnakan gambar berikut mengikut warna yang sesuai. Kemudian berikan contoh dengan bersarita berkaitan gambar serangga tersebut.

Aktiviti 3: Pilih jenis makanan bagi haiwan/serangga berikut dengan menanda (/) bagi makanan yang betul.

	Buah pisang
	Rumput

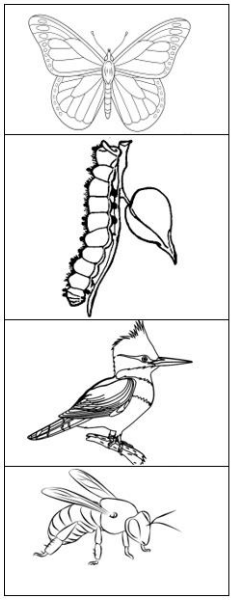
	Daun
	Ikan

	Buah
	Ikan

	Kacang
	Rumput

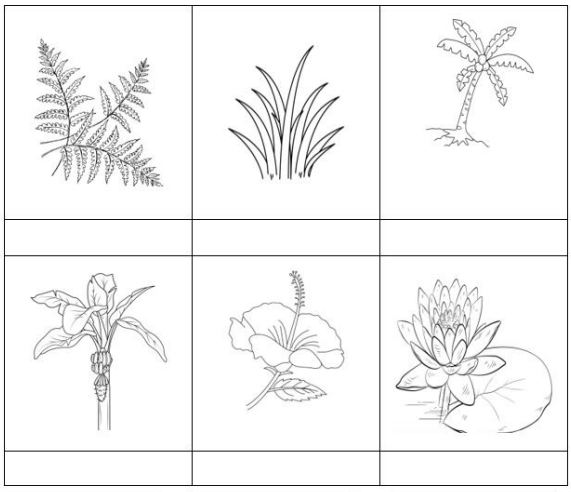
	Ikan
	Lalat

Aktiviti 4: Suaikan haiwan dan serangga dengan habitatnya.



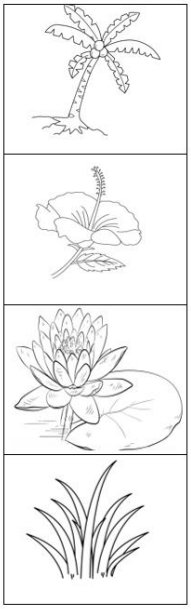
Aktiviti 1: Suaikan jawapan yang betul di dalam kotak yang disediakan.

TUMBUH-TUMBUHAN

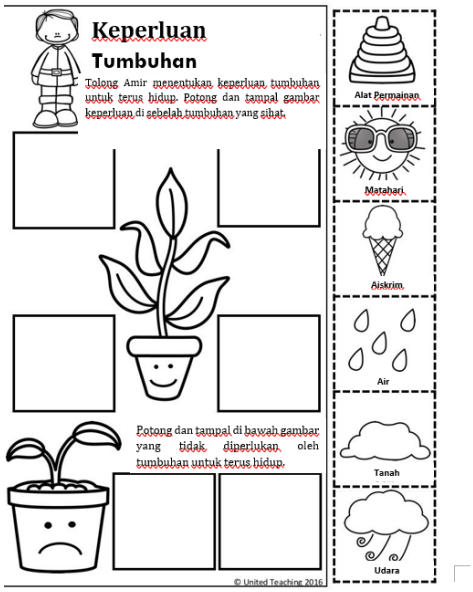


Rumput	Teratai	Pokok pisang
Bunga raya	Pokok kelapa	Paku-pakis

Aktiviti 2: Suaikan tumbuh-tumbuhan dengan habitatnya.



Aktiviti 4: Padankan keperluan kehidupan tumbuh-tumbuhan.



Aktiviti 5: Lukiskan gambaran adik-adik tentang alam semulajadi.